

INSTRUCTIONAL PRACTICE GUIDE: COACHING

MATH

SUBJECT

HS




GRADES

LESSON

GUIDE TYPE

The coaching tool is for teachers, and those who support teachers, to build understanding and experience with Common Core State Standards (CCSS) aligned instruction. Designed as a developmental tool, it can be used for planning, reflection, collaboration, and coaching. The three Shifts in instruction for Mathematics provide the framing for this tool.

The Shifts required by the Common Core State Standards for Mathematics are¹:

-  **Focus:** Focus strongly where the Standards focus.
-  **Coherence:** Think across grades, and link to major topics within grades.
-  **Rigor:** In major topics pursue conceptual understanding, procedural skill and fluency, and application with equal intensity.

The guide provides examples of what implementing CCSS for Mathematics look like in daily planning and practice. It is organized around three Core Actions which encompass the Shifts, instructional practice, and the mathematical practices. Each Core Action consists of individual indicators which describe teacher and student behaviors that exemplify Common Core aligned instruction.

The Core Actions and indicators should be evident in planning and observable in instruction. For each lesson evidence might include a lesson plan, problems and exercises, tasks and assessments, teacher instruction, student discussion and behavior, and student work. Although many indicators will be observable during the course of a lesson, there may be times when a lesson is appropriately focused on a smaller set of objectives or only a portion of a lesson is observed, leaving some indicators blank. Any particular focus should be communicated between teacher and observer before using the tool. Refer to the CCSS for Mathematics (corestandards.org/math) as necessary.

Companion tools for Instructional Practice include:

- Instructional Practice Guide: Coaching (Digital)- a digital version of this print tool, view at achievethecore.org/coaching-tool.
- Instructional Practice Guide: Lesson Planning- designed for teachers to support them in creating lessons aligned to the CCSS, view at achievethecore.org/lesson-planning-tool.

**STUDENT
ACHIEVEMENT
PARTNERS**

Date

Teacher Name

School

Observer Name

Course / Class Period / Section

Topic / Lesson / Unit

Standard(s) Addressed in this Lesson

Circle the aspect(s) of rigor targeted in the standard(s) addressed in this lesson¹:

Conceptual understanding

Procedural skill and fluency

Application

1. Refer to Common Core Shifts at a Glance (achievethecore.org/mathshifts) and the High School Publishers' Criteria for the Common Core State Standards for Mathematics (achievethecore.org/publisherscriteria) for additional information about the Shifts required by the CCSS.

SUMMARY OF CORE ACTIONS

Core Action 1

Ensure the work of the lesson reflects the Shifts required by the CCSS for Mathematics.

Indicators

- A. The lesson focuses on the depth of course-level cluster(s), course-level content standard(s) or part(s) thereof.
 - B. The lesson intentionally relates new concepts to students' prior skills and knowledge.
 - C. The lesson intentionally targets the aspect(s) of rigor (conceptual understanding, procedural skill and fluency, application) called for by the standard(s) being addressed.
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Core Action 2

Employ instructional practices that allow all students to learn the content of the lesson.

Indicators

- A. The teacher makes the mathematics of the lesson explicit by using explanations, representations, and/or examples.
 - B. The teacher provides opportunities for students to work with and practice course-level problems and exercises.
 - C. The teacher strengthens all students' understanding of the content by sharing a variety of students' representations and solution methods.
 - D. The teacher deliberately checks for understanding throughout the lesson and adapts the lesson according to student understanding.
 - E. The teacher summarizes the mathematics with references to student work and discussion in order to reinforce the focus of the lesson.
-

Core Action 3

Provide all students with opportunities to exhibit mathematical practices while engaging with the content of the lesson.

Indicators

- A. The teacher poses high-quality questions and problems that prompt students to share their developing thinking about the content of the lesson.
Students share their developing thinking about the content of the lesson.
- B. The teacher encourages reasoning and problem solving by posing challenging problems that offer opportunities for productive struggle.
Students persevere in solving problems in the face of initial difficulty.
- C. The teacher establishes a classroom culture in which students explain their thinking.
Students elaborate with a second sentence (spontaneously or prompted by the teacher or another student) to explain their thinking and connect it to their first sentence.
- D. The teacher creates the conditions for student conversations where students are encouraged to talk about each other's thinking.
Students talk about and ask questions about each other's thinking, in order to clarify or improve their own mathematical understanding.
- E. The teacher connects students' informal language to precise mathematical language appropriate to their course.
Students use precise mathematical language in their explanations and discussions.
- F. The teacher establishes a classroom culture in which students choose and use appropriate tools when solving a problem.
Students use appropriate tools strategically when solving a problem.
- G. The teacher asks students to explain and justify work and provides feedback that helps students revise initial work.
Student work includes revisions, especially revised explanations and justifications.

For each indicator, circle the appropriate rating based on what was observed during the lesson. Provide specific evidence to support the rating. Refer to questions, comments, and observations recorded in the preceding notes section.

Core Action 1

Ensure the work of the lesson reflects the Shifts required by the CCSS for Mathematics.

Indicators

A. The lesson focuses on the depth of course-level cluster(s), course-level content standard(s) or part(s) thereof.

YES

The lesson focuses only on mathematics within the course-level standards and fully reflects the depth of the course-level cluster(s), course-level content standard(s) or part(s) thereof.

NO

The lesson focuses on mathematics outside the course-level standards or superficially reflects the course-level cluster(s), course-level content standard(s) or part(s) thereof.

B. The lesson intentionally relates new concepts to students' prior skills and knowledge.

YES

The lesson explicitly builds on students' prior skills and knowledge and students articulate these connections.

NO

The lesson contains no meaningful connections to students' prior skills and knowledge.

C. The lesson intentionally targets the aspect(s) of rigor (conceptual understanding, procedural skill and fluency, application) called for by the standard(s) being addressed.

Circle the aspect(s) of rigor targeted in this lesson:

Conceptual understanding Procedural skill and fluency Application

YES

The lesson explicitly targets the aspect(s) of rigor called for by the standard(s) being addressed.

NO

The lesson targets aspects of rigor that are not appropriate for the standard(s) being addressed.

Core Action 2

Employ instructional practices that allow all students to learn the content of the lesson.

Indicators²

A. The teacher makes the mathematics of the lesson explicit by using explanations, representations, and/or examples.

- 4 A variety of instructional techniques and examples are used to make the mathematics of the lesson clear.
- 3 Examples are used to make the mathematics of the lesson clear.
- 2 Instruction is limited to showing students how to get the answer.
- 1 Instruction is not focused on the mathematics of the lesson.

B. The teacher provides opportunities for students to work with and practice course-level problems and exercises.

- 4 Students are given extensive opportunities to work with course-level problems and exercises.
- 3 Students are given opportunities to work with course-level problems and exercises.
- 2 Students are given limited opportunities to work with course-level problems and exercises.
- 1 Students are not given opportunities to work with course-level problems and exercises.

C. The teacher strengthens all students' understanding of the content by sharing a variety of students' representations and solution methods.

- 4 A variety of student solution methods are shared and examined together to support mathematical understanding for all students.
- 3 Student solution methods are shared to support mathematical understanding for some students.
- 2 Student solution methods are shared.
- 1 Student solution methods are not shared.

2. These actions may be viewed over the course of 2-3 class periods.

Core Action 2 (continued)

Employ instructional practices that allow all students to learn the content of the lesson.

Indicators

D. The teacher deliberately checks for understanding throughout the lesson and adapts the lesson according to student understanding.

- 4 There are checks for understanding used throughout the lesson to assess progress of all students and adjustments to instruction are made in response, as needed.
- 3 There are checks for understanding used throughout the lesson to assess progress of some students, minimal adjustments are made to instruction, even when adjustments are appropriate.
- 2 There are few checks for understanding, or the progress of only a few students is assessed. Instruction is not adjusted based on students needs.
- 1 There are no checks for understanding, therefore no adjustments are made to instruction

E.

The teacher summarizes the mathematics with references to student work and discussion in order to reinforce the focus of the lesson.

- 4 The lesson includes a summary with references to student work and discussion that reinforces the mathematics.
- 3 The lesson includes a summary with a focus on the mathematics.
- 2 The lesson includes a summary with limited focus on the mathematics.
- 1 The lesson includes no summary of the mathematics.

Core Action 3

Provide all students with opportunities to exhibit mathematical practices while engaging with the content of the lesson.³

Indicators ^{4,5}

A. The **teacher** poses high-quality questions and problems that prompt students to share their developing thinking about the content of the lesson.

Students share their developing thinking about the content of the lesson.

- 4 The teacher provides consistent opportunities and most students demonstrate this behavior.
- 3 The teacher provides consistent opportunities and some students demonstrate this behavior.
- 2 The teacher provides consistent opportunities and few students demonstrate this behavior.
- 1 The teacher does not provide students opportunity and very few students demonstrate this behavior.

B. The **teacher** encourages reasoning and problem solving by posing challenging problems that offer opportunities for productive struggle.

Students persevere in solving problems in the face of initial difficulty.

- 4 The teacher provides consistent opportunities and most students demonstrate this behavior.
- 3 The teacher provides consistent opportunities and some students demonstrate this behavior.
- 2 The teacher provides consistent opportunities and few students demonstrate this behavior.
- 1 The teacher does not provide students opportunity and very few students demonstrate this behavior.

C. The **teacher** establishes a classroom culture in which students explain their thinking.

Students elaborate with a second sentence (spontaneously or prompted by the teacher or another student) to explain their thinking and connect it to their first sentence.

- 4 The teacher provides consistent opportunities and most students demonstrate this behavior.
- 3 The teacher provides consistent opportunities and some students demonstrate this behavior.
- 2 The teacher provides consistent opportunities and few students demonstrate this behavior.
- 1 The teacher does not provide students opportunity and very few students demonstrate this behavior.

3. There is not a one-to-one correspondence between the indicators for this Core Action and the Standards for Mathematical Practice. These indicators represent the Standards for Mathematical Practice that are most easily observed during instruction.

4. Some portions adapted from 'Looking for Standards in the Mathematics Classroom' 5x8 card published by the Strategic Education Research Partnership (math.serpmedia.org/tools_5x8.html)

5. Some or most of the indicators and student behaviors should be observable in every lesson, though not all will be evident in all lessons.

Core Action 3 (continued)

Provide all students with opportunities to exhibit mathematical practices while engaging with the content of the lesson.

Indicators

D. The **teacher** creates the conditions for student conversations where students are encouraged to talk about each other's thinking.

Students talk about and ask questions about each other's thinking, in order to clarify or improve their own mathematical understanding.

- 4 The teacher provides consistent opportunities and most students demonstrate this behavior.
- 3 The teacher provides consistent opportunities and some students demonstrate this behavior.
- 2 The teacher provides consistent opportunities and few students demonstrate this behavior.
- 1 The teacher does not provide students opportunity and very few students demonstrate this behavior.

E. The **teacher** connects students' informal language to precise mathematical language appropriate to their course.

Students use precise mathematical language in their explanations and discussions.

- 4 The teacher provides consistent opportunities and most students demonstrate this behavior.
- 3 The teacher provides consistent opportunities and some students demonstrate this behavior.
- 2 The teacher provides consistent opportunities and few students demonstrate this behavior.
- 1 The teacher does not provide students opportunity and very few students demonstrate this behavior.

Core Action 3 (continued)

Provide all students with opportunities to exhibit mathematical practices while engaging with the content of the lesson.

Indicators

F. The **teacher** establishes a classroom culture in which students choose and use appropriate tools when solving a problem.

Students use appropriate tools strategically when solving a problem.

- 4 The teacher provides consistent opportunities and most students demonstrate this behavior.
- 3 The teacher provides consistent opportunities and some students demonstrate this behavior.
- 2 The teacher provides consistent opportunities and few students demonstrate this behavior.
- 1 The teacher does not provide students opportunity and very few students demonstrate this behavior.

G. The **teacher** asks students to explain and justify work and provides feedback that helps students revise initial work.

Student work includes revisions, especially revised explanations and justifications.

- 4 The teacher provides consistent opportunities and most students demonstrate this behavior.
- 3 The teacher provides consistent opportunities and some students demonstrate this behavior.
- 2 The teacher provides consistent opportunities and few students demonstrate this behavior.
- 1 The teacher does not provide students opportunity and very few students demonstrate this behavior.

This tool is for teachers, those providing support to teachers, and all educators working to implement the CCSS for Mathematics – it is not designed for use in evaluation. The guide should be used in conjunction with the CCSS Instructional Practice Guide: Supplement for Reflection Over the Course of the Year. Both tools are available at achievethecore.org/instructional-practice. For more information on teaching practices, see NCTM’s publication Principles to Actions: Ensuring Mathematical Success for All for eight Mathematics Teaching Practices listed under the principle of Teaching and Learning. <http://www.nctm.org/principles-to-actions>

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Send feedback to info@studentsachieve.net