



Implementing the Nevada Academic Content Standards for Mathematics

Talking About Solution Methods and Problem-Solving Strategies

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Essential Question

What strategies can we use to enhance our instruction so students learn mathematics with understanding?

Objective:

Increase our understanding of how to use discussion to orchestrate pedagogically sound active problem solving



Four Steps Toward Productive Talk

Helping Individual Students Clarify and Share Their Own Thoughts

Helping Students Orient to the Thinking of Others

Helping Students Deepen Their Own Reasoning

Helping Students Engage with the Reasoning of Others



Using Discussions in Problem-Solving

1. Understand a problem
2. Explain one solution method
3. Extend students' knowledge of problem-solving strategies
4. Compare solution methods and generalize



Birthday Party Problem

3.OA.A: Represent and solve problems involving multiplication and division



Using discussion to UNDERSTAND A PROBLEM

60 second **Stop and Jot.**

Turn & Talk with the person next to you.



Using discussion to EXPLAIN ONE SOLUTION METHOD

5B Solving a Multistep Word Problem, Part 2



Norms for Viewing Records of Practice

- Assume that there are many things you don't know about students, and the shared history of the teacher and students in the video.
- Assume good intent and expertise on the part of the teacher.
- Keep focused on your observations about what student are getting out of the talk and interaction.
- Keep focused on how the classroom discourse is serving the mathematical goals of the lesson.



Using discussion to EXPLAIN ONE SOLUTION METHOD

5B Solving a Multistep Word Problem, Part 2



Using discussion to
**EXTEND STUDENTS' KNOWLEDGE OF
PROBLEM-SOLVING STRATEGIES
and
COMPARE SOLUTION METHODS
AND GENERALIZE**



What are you noticing about this student's understanding of the problem?

Where are they within the trajectory of developing an understanding of multiplication?

Are they using this understanding efficiently to solve problems?



Compare the varying strategies and solutions.

What two student work samples might you use within a whole class discussion to extend students' knowledge of strategies?

Which would you use to compare solution methods?



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CCSS INSTRUCTIONAL PRACTICE GUIDE

MATH

MATHEMATICS

K-8

GRADES K-8

D

DAILY

This guide provides concrete examples of what the Core Actions for implementing the Common Core State Standards (CCSS) for Mathematics in grades K-8 look like in daily planning and practice. It is designed as a developmental tool for teachers and those who support teachers and can be used to observe a lesson and provide feedback or to guide lesson planning and reflection. For all uses, refer to the CCSS for Mathematics (corestandards.org/math) and the grade-level content emphases (achievethecore.org/emphases).

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

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

Date:

Class:

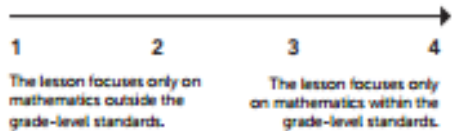
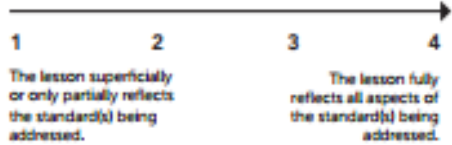
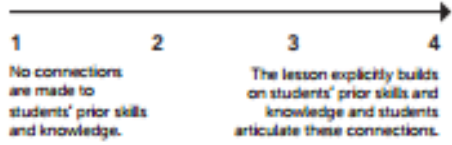
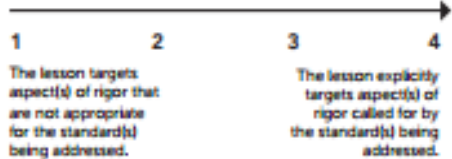
Teacher:

Unit or Lesson:

Standards Addressed:

The Core Actions should be evident in planning and observable in instruction. For each lesson, artifacts or observables might include: lesson plan, problems and exercises, tasks and assessments, teacher instruction, student discussion and behavior, and student work. When observing a portion of a lesson, some indicators may be appropriately left blank.

CORE ACTION 1: Ensure the work of the lesson reflects the shifts required by the CCSS for Mathematics.

INDICATORS	EVIDENCE OBSERVED OR GATHERED	
A. The lesson focuses on grade-level cluster(s), grade-level content standard(s) or part(s) thereof.		Notes:
B. The lesson reflects the full intent of the grade-level cluster(s), grade-level content standard(s) or part(s) thereof being addressed.		
C. The lesson intentionally relates new concepts to students' prior skills and knowledge.		
D. The lesson intentionally targets the aspect(s) of rigor (conceptual understanding, procedural skill and fluency, application) called for by the standard(s) being addressed.		<p>Note the aspect(s) of rigor targeted in this lesson:</p> <p>conceptual understanding procedural skill and fluency application</p>