



Implementing the Mathematics Nevada Academic Content Standards

Talking about mathematical terminology,
symbols, and definitions

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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



Essential Questions

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

What does this look and sound like?

Objective:

How to support Implementing classroom discussions that build understanding of mathematical terminology, symbols, and definitions.



What is half?

60 second **Stop and Jot.**

Turn & Talk with your colleagues.



What is half?

What language is missing
that could aid in the
definition?



How do we learn mathematical terms?

Think about it. Jot down two ways to learn mathematical terms.

Read p. 217-218 from Classroom Discussions in Math

Annotate

!- That's just what I was thinking!

?- Really?

√ - I really need to check this out!



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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.



How might a student respond to this question?

If half an hour is 30 minutes,
is half a dollar equal to 30
cents?



As you watch the video clip consider these questions:

- **How are the four steps toward productive talk revealed during the small group discussion?**
- **How does this establish the purpose and direction for the whole class discussion?**



Video

7A: Making Sense of One-Half



How did the teacher facilitate the learning using productive talk?



We have discussed words that must carry their context with them.



What are ALL the possible meanings of this symbol?





What about symbols?

In mathematics symbols are part of the academic vocabulary to be developed.



For example, research has shown that many students do not see the equal sign (=) as a statement of equivalence.

How would you facilitate a class discussion where students work through the meaning of the equal sign (=) using talk moves?



Use Appendix C: Lesson Planning Template (Classroom Discussions in Math)





To develop an understanding of mathematical terminology, symbols, and definitions, students need...





Four Suggestions for Using Whole Class Discussions Related to Mathematical Terminology, Symbols, and Definitions (p.219)

- to sort out different word meanings
- To extend students' knowledge
- To build and monitor common understandings
- To develop the meaning of symbols



**What mathematical practices are students using when engaged in productive talk about mathematical terminology, symbols, and definitions?
What might this look and sound like?**



IS/Coach Support

Instructional Practice Guide

- How can the instructional practice guides be used to support teachers' instruction of mathematical terminology, symbols, and definitions?

CCSS INSTRUCTIONAL PRACTICE GUIDE



MATHEMATICS



GRADES K-8



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:

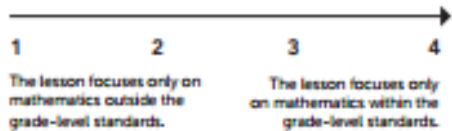
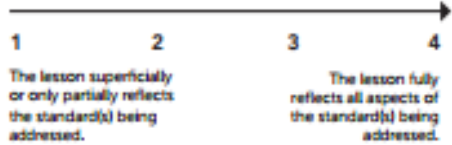
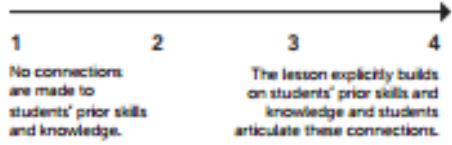
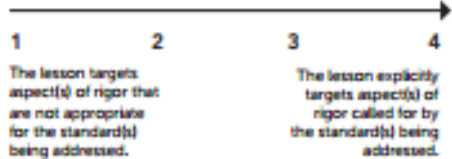
Teacher:

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>



Questions?



References:

www.wcsdcandi.com

National Council of Teachers of Mathematics (NCTM).

Chapin, S., O'Connor, C., Anderson, N. (2013). *Classroom Discussions in Math: A Teacher's Guide for using talk moves to support the Common Core and more*. Math Solutions.

<http://www.ascd.org/publications/books/108035/chapters/Procedures-for-Classroom-Talk.aspx>