Common Core Planning for Content & Practice

Preparing Los Angeles Students for College and Career
Outcomes

• Plan a Common Core aligned problem-based lesson using John Van de Walle’s Three-Phase Structure
  – Teachers will be expected to facilitate (at least) one problem-based lesson a week during the 2013-14 school year

• Identify strategies that meet the needs of our diverse learners: English learners (EL), Standard English learners (SEL), Students with Disabilities (SWD), and students identified as Gifted and Talented (GATE)

• Make connections between the Common Core Standards for Mathematical Practice and the enVisionMATH program
Three-Phase Structure

### Thinking Through a Lesson Protocol

The main purpose of the Thinking Through a Lesson Protocol is to prompt you in thinking deeply about a specific lesson that you will be teaching that is based on a cognitively challenging mathematical task.

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### Before

- Practices 5 for Orchestrating Productive Mathematics Discussions
  - Margaret S. Smith
  - Mary Kay Stein

### During

- **SET-UP**
  - What questions will you ask to focus their thinking?
  - What will you see or hear that lets you know how students are thinking about the mathematical ideas?
  - What questions will you ask to assess students' understanding of key mathematical ideas, problem-solving strategies, or other representations?
  - What questions will you ask to advance students' understanding of the mathematical ideas?
  - What questions will you ask to encourage students to share their thinking with others or to assess their understanding of their peer's ideas?
  - How will you ensure that students remain engaged in the task?
  - What will you do if a student does not know how to begin to solve the task?
  - What will you do if a student finishes the task almost immediately and becomes bored or disruptive?
  - What will you do if students focus on non-mathematical aspects of the activity (e.g., spend most of their time making beautiful posters of their work)?

### After

- How will you orchestrate the class discussion so that you accomplish your mathematical goals? Specifically:
  - Which solution paths do you want to have shared during the class discussion? In what order will the solutions be presented? Why?
  - In what ways will the order in which solutions are presented help develop students' understanding of the mathematics that are the focus of your lesson?
  - What specific questions will you ask students will:
    - make sense of the mathematics they want to learn?
    - expand on, debate, and question the solutions being shared?
    - make connections between the strategies that are presented?
    - look for patterns?
    - begin to form generalizations?
  - What will you see or hear that lets you know that students in the class understand the mathematical ideas that you intended for them to learn?
Three-Phase Structure

- Activate prior knowledge
- Review vocabulary
- Pose the problem
- Ensure that students understand the task
Three-Phase Structure

- Let go!
- Circulate as students independently work in pairs or groups
- Ask questions to focus, assess, and advance student thinking
- Decide which solutions will be selected for sharing
Three-Phase Structure

- Facilitate the sharing of two or more solution paths
- Order selected solutions to help generate a mathematically productive discussion
- Facilitate a student-centered discussion so that students:
  - Develop an understanding of the concept
  - Add on to and question solutions shared
  - Make connections between the solutions presented
  - Find generalized characteristics within the problem
- Summarize the main idea and identify next steps, future problems

Before

During

After

15 Minutes
Anticipating

As a grade level team, select one task for planning purposes.

Pose the Problem

Four friends want to share 3 submarine sandwiches. How much of a sandwich will each friend get? Use the paper strips. Work in pairs to model this problem. Write an explanation of how you solved the problem as well as the solution. Give students time to work. Then have them share their work and solutions with the class.
Anticipating

- Evaluate the rigor of the task using the Task Analysis Guide.
- Modify the task as needed.
- Record the agreed upon task on the planning sheet.

**Pose the Problem**

Four friends want to share 3 submarine sandwiches. How much of a sandwich will each friend get? Use the paper strips. Work in pairs to model this problem. Write an explanation of how you solved the problem as well as the solution. Give students time to work. Then have them share their work and solutions with the class.
There is no decision that teachers make that has a greater impact on students’ opportunities to learn and on their perceptions about what mathematics is than the selection or creation of the tasks with which the teacher engages students in studying mathematics.

- Lappan & Briars, 1995
Anticipating

• Review the math goals and suggestions for activating prior knowledge.

• What might you add to meet the needs of our diverse learners (EL, SEL, SWD, At-Risk, GATE)?

• Record ideas on the Interactive Learning handout
Anticipating Possible Solution Paths

PROBLEM BASED INTERACTIVE LEARNING

STANDARD/S: NS 1.5 - Explain different representations of fractions, equivalent fractions and division of whole numbers by whole numbers.

TASK

Four friends want to share 3 submarine sandwiches. How much of a sandwich will each friend get?

Model the problem and write an explanation of how you solved the problem.

POSSIBLE SOLUTIONS

Solve the problem as many ways as possible on the planning sheet.
Anticipating

Grade Level Discussion:

• What misconceptions might students have?
• What errors might students make?
• Which three student solution paths might be shared during the After phase? Why?
  – Number them sequentially and record a rationale.
College & Career Ready

Lesson Design Template

- Instructional Goals and Objectives
- Prior Knowledge
- Additional Support for Specific Groups of Learners
“Pedagogy trumps curriculum. Or more precisely, pedagogy is curriculum, because what matters is how things are taught, rather than what is taught.” (Wilian, 2011)

– Common Core Mathematics in a PLC at Work – Larson, Fennell, Lott Adams, Dixon, McCord Kobett, Wray
The Standards for Mathematical Practice

Overarching Habits of Mind
MP1 Make sense of problems and persevere in solving them.
MP6 Attend to precision.

Reasoning & Explaining
MP2 Reason abstractly and quantitatively.
MP3 Construct viable arguments and critique the reasoning of others.

Modeling & Using Tools
MP4 Model with mathematics.
MP5 Use appropriate tools strategically.

Seeing Structure & Generalizing
MP7 Look for and make use of structure.
MP8 Look for and express regularity in repeated reasoning.
Standard 3: Delivery of Instruction

b. Using Questioning and Discussion Techniques

1. Quality and Purpose of Questions
2. Discussion Techniques and Student Participation
Questioning

• Record MP3 aligned questions you will ask during each of the three phases.

• Effective questions often begin with *How, What, & Why*.

A question not asked is a door not opened.

- Marilee Goldberg, *The Art of the Question*
SDAIE Interactions

• Do I provide many different opportunities for students to talk about the lesson concepts?

• Do I provide many opportunities for questioning between students and teacher and among students?

• Do I plan real-life (authentic) activities that offer opportunities for listening, speaking, reading, and writing?
Grade Level Charting

Create a poster that demonstrates your problem-based learning, including:

• The task
• Three possible solution paths
• A key question for each phase
Anchor Standards for ELA and Content Literacy

Reading 1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textural evidence when writing or speaking to support conclusions drawn from the text.

Speaking and Listening 1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
Vertical Articulation

- Circulate the room with your school team.
- Record new ideas as peers share their posters.
- When you arrive at your grade level poster, present the work to your school team.
Resources

Literature Connections

Additional Resources

enVisionMATH
Thank You

“Your goal will be to develop in students both conceptual understanding and procedural fluency of the CCSS content through the collaborative selection of high-cognitive-demand mathematical tasks with a focus on engagement with the Standards for Mathematical Practice”

*Common Core Mathematics in a PLC at Work*  
– Larson, Fennell, Lott Adams, Dixon, McCord Kobett, Wray