CMP PLANNING GUIDE: Unit _____ Investigation ____ Problem _____

Mathematical Goals and Focus Question

- What is the fundamental mathematical idea that is important to this lesson? (Primary learning goal)
- What are some secondary mathematical goals that may arise?
- What is the Focus Question (FQ) for this problem?
- What is the relationship between the goals, the FQ (Focus Question), and the questions in the Problem?

Launch

Other Considerations

Vocabulary, Materials, Processes, Notes

Connecting to Prior Knowledge

- What prior knowledge will students need to do the problem?
- How can I connect to previous problems or knowledge?

Presenting the Challenge

- Do I need to introduce any contextual information? Any mathematical information?
- How can I keep from giving away how to do the problem?
- How will I have student share their learning from the Explore portion of the lesson?

Explore

Providing for Individual Needs

- What is the most effective student arrangement for this problem? (individual, pair, group, whole class)
- What are different strategies that I anticipate students using?
- What struggles do I anticipate? (Areas of difficulty or misconceptions or underdeveloped ideas)
- What questions might I ask to:
  - ⇒ Stimulate thinking and reasoning? Encourage student conversation and sharing of ideas?
  - ⇒ Focus thinking if students are off-task or become frustrated?
  - ⇒ Help students sort out the ideas? How will I scaffold without lowering the mathematical task?
  - ⇒ Make students probe further into the mathematics if the initial question is "answered"?
  - ⇒ Check for understanding? Extend their learning?

Planning for the Summary

- What progress should all students make on the mathematical goals before I end the Explore?
- How will I keep track of student thinking and strategies?
- How will I transition the class from the Explore to the Summary of the lesson?

Summarize

Orchestrating the Discussion: Making the Mathematics Explicit

- What are the key questions that maximize the mathematical opportunities in the problem?
- What concepts, processes, or strategies need to be emphasized?
- What ideas do not need closure at this time?
- Are there definitions or strategies that we need to generalize?
- What thinking or strategies from individuals/pairs/groups should the whole class hear? How can the order of the presentations contribute to the students' understanding?
- What question(s) could I ask to check for understanding?
- What question(s) could I ask to connect their thinking to prior learning or extend the learning?
- What will I count as evidence that my students can sufficiently answer the Focus Question?

Orchestrating the Discussion: Encouraging Participation

- How will I have students share what they have learned?
- What questions can I ask to:
  - ⇒ Get students to talk about what they have made sense of?
  - ⇒ Help students clarify their thinking and justify their reasoning?
  - ⇒ Have students show mathematical misconceptions so the whole class can address them?
- How can I help students to:
  - ⇒ Listen to and appreciate each other's thinking? Challenge ideas that are incomplete/not clear?
  - ⇒ Ask questions of each other and me?
  - ⇒ Take notes on the essential idea for future reference?

Reflecting on Student Learning

- How will I know if my students understand the mathematics?
- How will I revisit and connect the concepts and skills from today in other lessons?
- What will I do to follow-up on, practice, or apply the ideas after the summary?

Homework: Is there a reason to assign homework? If so, which problems will I assign?

Reflections on the Lesson

As you consider each reflection question, the natural follow up to each question is, "What is my evidence?"

Reflecting on the Launch and Explore

- Did I make sure students had enough information to do the problem?
- Did I keep the Launch short?
- Did I give away too much? Was the mathematical potential of the problem left intact?
    - Did my students know what to do from what was said or asked? My answer should be: "Yes."
    - Did my students know how to do it from what was said or asked? (Did I tell them how to do the problem?) My answer should be: "No."
- Did I provide time to think individually before students heard thinking from others?
- Did students present new strategies from those that I had anticipated?
- Did my questions help students to clarify, generalize, and extend their thinking?
- Did I help students manage their time and how to share ideas with others?
- Did I make sure that students had enough of the problem done so that they could follow the thinking of others in the summary of the lesson?
- Did I attend to individual needs without giving away the challenge?
- Did the Focus Question help to guide when students were ready for the Summary?

Reflecting on the Summarize

- How did the lesson go compared to what I had expected?
- What do my students know as a result of the lesson?
- Did we reach the mathematical goal of the problem?
- Did all the students or just some students understand the mathematics? What is my evidence?
- Did students have the opportunity to clarify any incomplete ideas or misconceptions? What is my evidence?
- Did students ask questions to clarify, challenge, show understanding, connect ideas, or go beyond?
- Do students have a record of the mathematical learning to reference later? (notes, vocabulary)
- Did I have all students actively engaged in the summary – presenting ideas, asking questions, answering questions, considering others' thinking, clarifying thinking, taking notes, etc.
- What mathematical questions do students still have?
- What concepts or skills from this lesson do students need to learn, refine, and/or practice?
- What will I do to follow up on, practice, or apply the ideas of today's lesson?
- How will I connect these concepts to related ideas in future problems?
- How will the evidence from this lesson help me plan the next lesson? The next Investigation? The next unit?