



Questions that Assist Teacher Reflection

Administrators often ask “What should a good math lesson look like?” In general, the **students** should be the ones having deep mathematical discourse and the teacher should be there to guide and coach them through the process if needed. The three major components of a CPM lesson are the introduction (the Launch), the team problems or activity (the Explore), and the closure (the Summary). One suggestion for observing is to choose one of these components to focus on each time you are in a classroom. In brief, here is the purpose of each

The Launch - Getting the Lesson Started

In the first phase, the teacher introduces the lesson to the whole class. This may come after a quick warm up activity that either emphasizes learning from the previous day, reviews skills, or both. The introduction helps students understand the problem setting.

This is also the time when the teacher introduces new ideas, clarifies definitions, reviews old concepts, and connects the problem(s) to past experiences of the students. It is critical that, while giving students a clear picture of what is expected, the teacher leaves the potential of the task intact. He or she must be careful not to tell too much and consequently lower the challenge of the task to something routine, or to cut off the rich array of strategies that may evolve from a more open launch of the problem.

Here are some questions for discussion about the launch before you observe a CPM Classroom:

- *I've heard that the beginning of a lesson is a critical part of a CPM lesson but I don't know much about it. Can you tell me a little about your understanding of how a lesson is started and what the role of the teacher is?*
- *How will you be introducing the tasks in the lesson I'll be watching?*
- *What are students expected to do?*
- *What do the students need to know to understand the context of the situation and the challenge of the tasks?*
- *What difficulties do you foresee for students?*
- *How will you keep from giving away too much of the problem solution?*
- *How do you pace your time so that you spend enough time on the launch but not too much?*

Here are some questions for discussion about the launch after you observe a CPM Classroom

- *What do you think went well with the introduction?*
- *What was the most difficult part of introducing this lesson?*
- *How did the introduction help students with this particular lesson?*
- *What would you do differently next time?*
- *Give the teacher feedback about whether it was apparent to you when the introduction started and ended – how much time was spent on it.*

The Explore - Team Problems/Class Work

A typical CPM lesson provides several core problems that students are expected to work through as a team. As students work, they gather data, share ideas, look for patterns, make conjectures, and develop problem-solving strategies.

It is inevitable that students will exhibit variation in their progress. The teacher's role during this phase is to move about the classroom, observing individual performance and encouraging on-task behavior. The teacher helps students persevere in their work by asking appropriate questions and providing confirmation and redirection where needed. For students who are interested in and capable of deeper investigation, the teacher may provide more extended questions related to the problem. These questions are identified as non-core problems and are provided in the Teacher's Guide. This part of the instruction is an appropriate place to attend to *differentiated learning*.

Here are some questions for discussion about class work before you observe a CPM Classroom:

- *I've heard that the class work is a critical part of a CPM lesson but I don't know much about it. Can you tell me a little about your understanding of the purpose of the class work and should be structured?*
- *Will you be using team roles in the lesson I observe? What will they be?*
- *How should students record and report their work?*
- *What different strategies can I anticipate they might use?*
- *What questions will you ask to encourage student conversation, thinking, and learning?*
- *What questions will you ask to focus their thinking if they become frustrated or off-task?*
- *What will you do if there are some teams who complete the core problems and need more of a challenge?*
- *What are some study team strategies that you might use during the lesson?*

Here are some questions for discussion about class work after you observe a CPM Classroom:

- *What do you think went well during class work (team work)?*
- *What was the most difficult part of the class work in this lesson?*
- *What would you do differently next time?*
- *Give the teacher specific feedback about observations you made during the class work phase (you moved around the room well, I heard you asking students questions as you visited each group, it seemed like most students were engaged in the task, etc...)*

The Summary – Lesson Closure

It is during closure that the teacher guides the students to reach the mathematical goal of the problems and to connect their new understanding to prior mathematical goals and problems in the unit. The closure phase of instruction begins when most students have gathered sufficient data or made sufficient progress toward solving the core problems. In this phase, students may present and discuss their solutions as well as the strategies they used to approach a problem, organize the data, and find the solution. During the discussion, the teacher helps students enhance their conceptual understanding of the mathematics in the problem and guides them in refining their strategies into efficient, effective, generalizable problem-solving techniques or algorithms. A suggestion is given in the teachers guide on the amount of time to allow for closure and specific ways to approach it.

Although the closure discussion is led by the teacher, students play a significant role. Ideally, they should pose conjectures, question each other, offer alternatives, provide reasons, refine their strategies and conjectures, and make connections. As a result of the discussion, students should become more skillful at using the ideas and techniques that come out of the experience with the class work.

If it is appropriate, the closure can end by posing a problem or two that checks students' understanding of the mathematical goal(s) that have been developed at this point in time. The recommended homework after each lesson always contains a review of past concepts as well as new learning.

Here are some questions for discussion about closure before you observe a CPM Classroom:

- *I've heard that "closure" is a critical part of a CPM lesson but I don't know much about it. Can you tell me a little about your understanding of the purpose of the closure and how it works?*
- *How will you orchestrate the discussion so that students summarize their thinking about the problem?*
- *What questions can guide the discussion?*
- *What concepts or strategies need to be emphasized?*
- *Are there any ideas that do not need closure at this time and why?*
- *What definitions or strategies will they need to generalize?*
- *What connections and extensions can be made?*
- *What new questions might arise and how will you handle them?*
- *What will you do to follow up, practice, or apply the ideas after closure?*

Here are some questions for discussion about the closure after you observe a CPM Classroom:

- *What do you think went well with the closure?*
- *What was the most difficult part of the closure in this lesson?*
- *What did students come away from this lesson knowing?*
- *As you were circulating while students were working on the core problems, how did you identify which student ideas you were going to bring out in the closure?*
- *How do you make sure there is time for closure at the end of every lesson?*
- *What do you do if time runs out before a good closure has taken place?*