Practices for Orchestrating Productive Mathematics Discussions

Anticipating student responses prior to the lesson

What should you consider?	How is this supported?
• The strategies that students might use to approach or solve a challenging mathematical task • How to respond to what students produce • Which strategies are most useful in addressing the mathematics to be learned	• Solving the problem in as many ways as possible • Solving the problem with other teachers • Drawing on relevant research when possible • Documenting student responses year to year

Monitoring students' work on, and engagement with, the task

What does this involve?	How is this supported?
• Circulating while students work, watching and listening • Recording interpretations, strategies, and points of confusion • Asking probing questions to get students back "on track" or to advance their understanding	• Anticipating student responses beforehand • Using a recording tool • Observing students' actual responses during independent work

Selecting particular students, or groups of students, to present their mathematical work

What does this involve?	How is this supported?
• Choosing students to present because of the mathematics in their responses • Making sure that over time all students are seen as authors of mathematical ideas and have the opportunity to demonstrate competence • Gaining some control over the content of the discussion	• Anticipating and monitoring • Planning in advance which types of responses to select, perhaps considering an incorrect solution to illustrate a typical misconception • Being ready to consider unanticipated solutions

Sequencing students' responses in a specific order for discussion

What does this involve?	How is this supported?
• Purposefully ordering presentations so the mathematics is accessible to all students • Building a mathematically coherent story line from prior knowledge to current grade-level standards.	• Anticipating, monitoring, and selecting • During anticipation work, considering how possible student responses are mathematically related
Ways to *sequence* student responses	
• Begin with the strategy used by the majority of students before moving to those strategies that only a few students used. • Begin with a strategy that is more concrete, and then move to strategies that are more abstract. • Present strategies that address common misconceptions. • Have related or contrasting strategies presented one right after the other.	

Connecting different student responses, and *connecting* the responses to key mathematical ideas

What does this involve?	How is this supported?
• Encouraging students to make mathematical connections between different student responses through questioning • Making the key mathematical ideas that are the focus of the lesson salient • Considering extensions as they come from the students or the teacher	• Anticipating, monitoring, selecting, and sequencing • Considering how students might be prompted to recognize mathematical relationships between responses • Cultivating a classroom culture with explicit supports for student discourse

Adapted from Smith, M. S., & Stein, M. K. (2011). *5 practices for orchestrating productive mathematics discussions.* Reston, VA: National Council of Teachers of Mathematics.