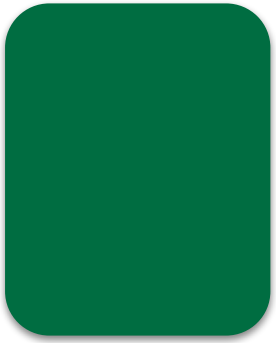
Building on Discourse Virtual – Session 3

Rev 5/30/23 (ce)

Welcome to Building on Discourse!

Session 3: Monitoring and Advancing Student Thinking During Discourse

Session Facilitators



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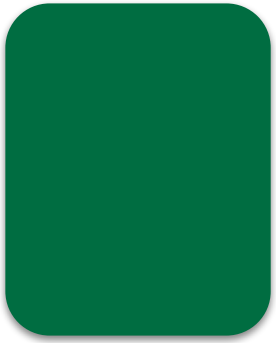

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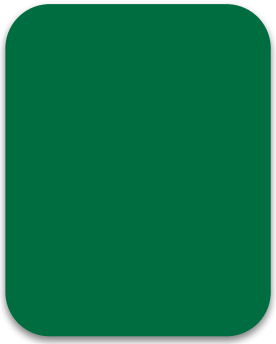
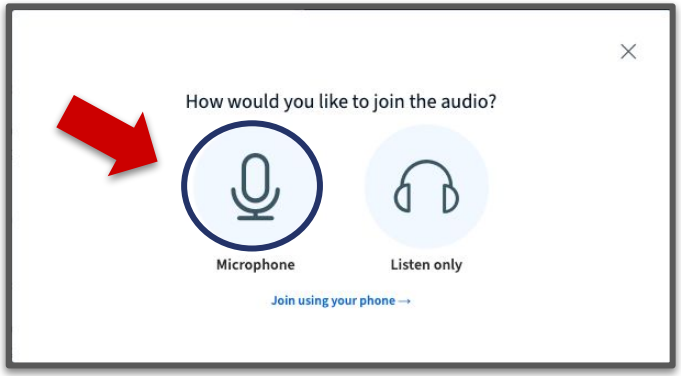


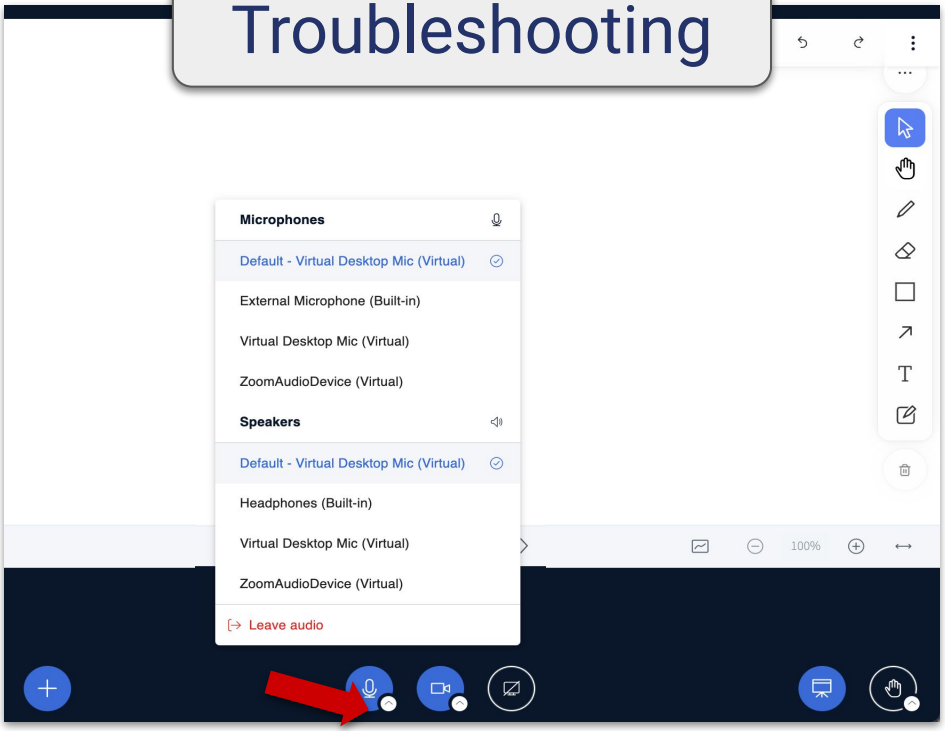
Regional Professional Learning Coordinator

Tech Tip

Audio



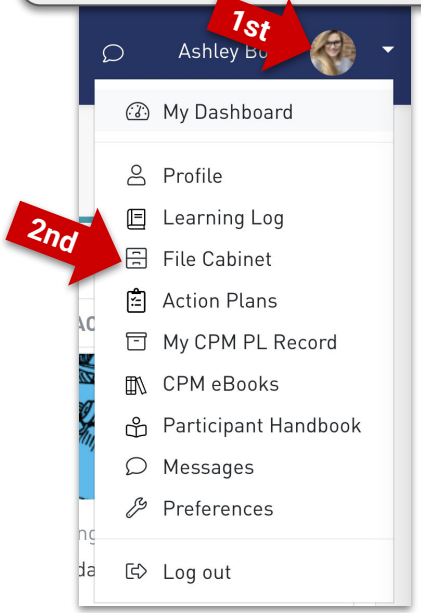
Troubleshooting

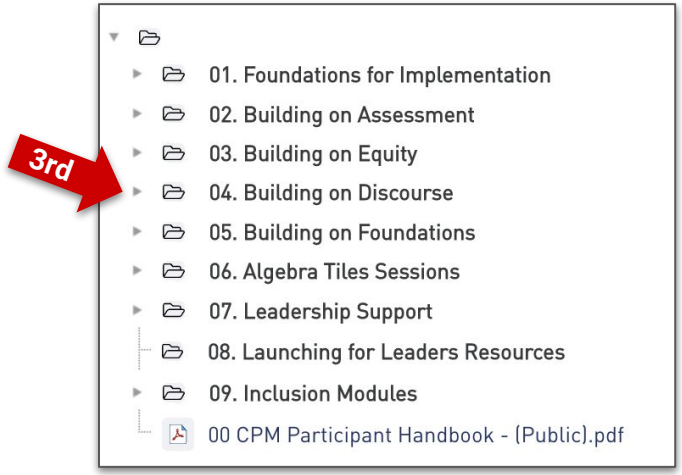


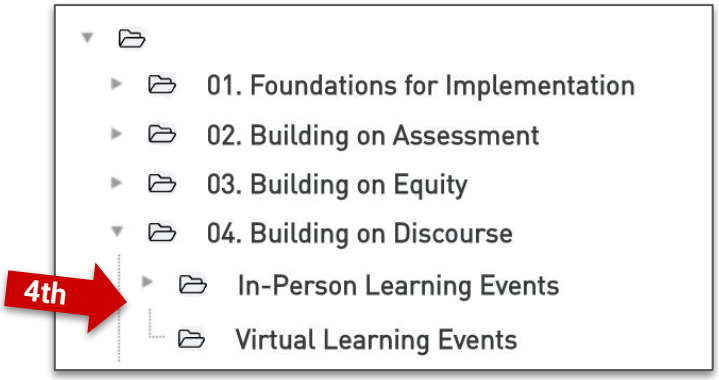
Tech Tip

Getting Session Resources

File Cabinet







Opening

Session 3 Outcomes

Together we will:

+ Experience the Effective Mathematics Teaching Practices through the design of the *5 Practices*.
+ Better understand how facilitating meaningful mathematical discourse develops an equitable, student-centered classroom.
+ Develop purposeful questions that assess and advance student thinking.

Opening

Agenda - Session 3

Focus: Building on Discourse

- ☐ Icebreaker
- ☐ Math Task
- ☐ Purposeful Questioning
- ☐ Closure

Welcome

Equity Principles

- The goal of teaching is to help all students transition from dependent to independent learners.
- Relationships are of vital importance.
- Student uniqueness is an asset, not a deficit.
- Reflection is a crucial part of growth.

Click on your name and set your status to thumbs-up if you are ready to begin.

CPM uses these principles to guide our vision and mission of More Math for More People.

Agenda

Focus: Building on Discourse

- [x] Icebreaker
- [ ] Math Task
- [ ] Purposeful Questioning
- [ ] Closure

Agenda

Focus: Building on Discourse

- [x] Icebreaker
- [x] Math Task
- [ ] Purposeful Questioning
- [ ] Closure

Math Task

Focusing Learning

Learning Target:

Consider how a teacher's decisions and actions affect meaningful math discourse.

Math Task

Core Connections, Course 3 – Lesson 4.1.1

Student Math Goal:
Finding connections between different representations of the same pattern.

Team Collaboration Goal:
Collaborate and actively listen to your team because everyone's thinking and ideas matter.

Math Task

Launch

Tile Pattern Team Challenge

Your team's task is to create a poster showing every way you can represent a pattern, highlighting all of the connections between the representations that you can find. For this activity, finding and showing the connections are the most important parts. Clearly presenting the connections between representations on your poster will help convince your classmates that your description of the pattern makes sense.

Modified from Lesson 4.1.1A Resource Page Page 4 of 5 Problem 4-1, pattern (d)

Math Task

Rough Draft Thinking

Student

Think-Ink

1. **Individually think** about Figures 1, 2, and 3. **Please do not begin solving the problem, *YET.***

2. **Ink** your responses to the questions on a piece of paper.

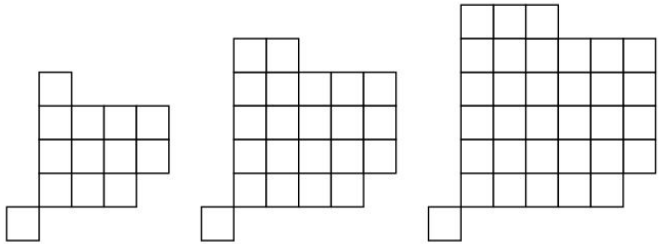


Figure 1 Figure 2 Figure 3

*What do you **know**?*

*What do you **wonder**?*

*What **questions** might you have?*

*What **strategies** might you want to use?*

Math Task

Closure - Student Connections

Selected Team Presentations:

As teams share, think of the following questions.

How is this team's approach similar or different from your team's approach?

What questions do you have for the team?

Does their team's approach help clarify your own thinking?

Math Task

Closure – Reflection on Learning Target and Success Criteria

Learning Target:

Consider how a teacher's decisions and actions affect meaningful math discourse.

Success Criteria:

1. Name how the facilitator promoted discourse.
2. Name how questioning affected your team's learning.

Post your response in Public Chat

Agenda

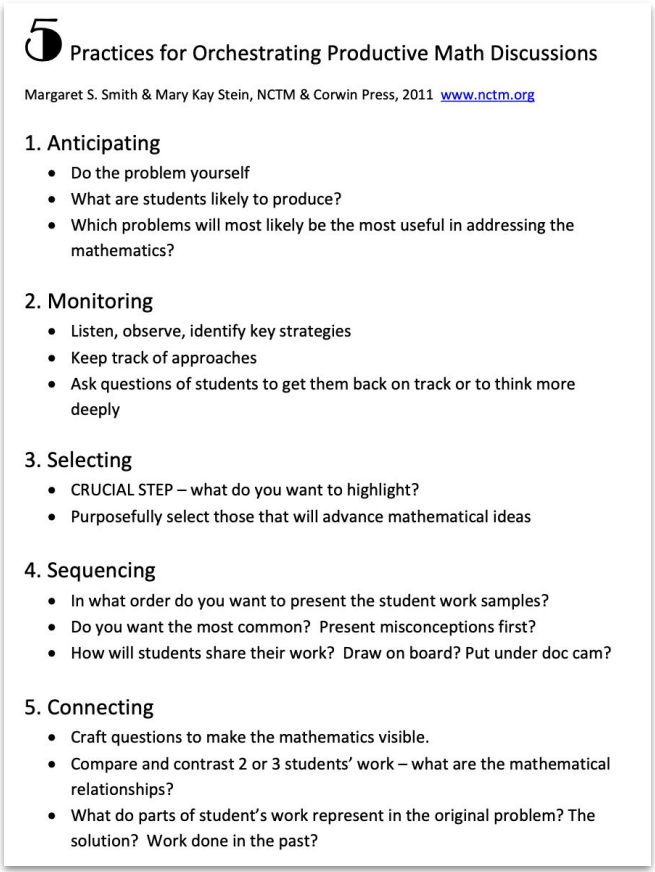
Focus: Building on Discourse

- [x] Icebreaker
- [x] Math Task
- [x] Purposeful Questioning
- [ ] Closure

Purposeful Questioning

5 Practices Overview

1. **Anticipating**
2. Monitoring
3. Selecting
4. Sequencing
5. Connecting



5 Practices for Orchestrating Productive Math Discussions

Margaret S. Smith & Mary Kay Stein, NCTM & Corwin Press, 2011 www.nctm.org

1. Anticipating
   - Do the problem yourself
   - What are students likely to produce?
   - Which problems will most likely be the most useful in addressing the mathematics?

2. Monitoring
   - Listen, observe, identify key strategies
   - Keep track of approaches
   - Ask questions of students to get them back on track or to think more deeply

3. Selecting
   - CRUCIAL STEP – what do you want to highlight?
   - Purposefully select those that will advance mathematical ideas

4. Sequencing
   - In what order do you want to present the student work samples?
   - Do you want the most common? Present misconceptions first?
   - How will students share their work? Draw on board? Put under doc cam?

5. Connecting
   - Craft questions to make the mathematics visible.
   - Compare and contrast 2 or 3 students' work – what are the mathematical relationships?
   - What do parts of student's work represent in the original problem? The solution? Work done in the past?

Purposeful Questioning

Next Steps

0. Selecting a rich task and writing a lesson goal:
   - Select a rich task.
   - Identify specific lesson goals.
   - Select and plan the activity.

1. **Anticipating:**
   - Anticipate student strategies.
   - Do the problem in many *different* ways.
   - **Plan assessing & advancing questions.**

2. **Monitoring:**
   - Listen, observe, identify key strategies.
   - Keep track of approaches and progress.
   - **Ask questions to uncover student thinking and to move learning forward.**

Purposeful Questioning

Focusing Learning

Learning Target:

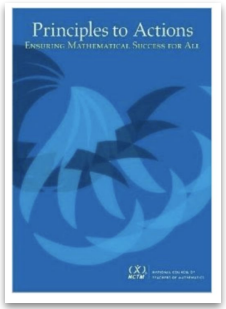
Understand how purposeful questioning can affect student learning.

Purposeful Questioning

Connecting to Mathematics Teaching Practices

Pose Purposeful Questions

*"Effective teaching of mathematics uses purposeful questions to **assess** and **advance** students' reasoning and sense making about important mathematical ideas and relationships."*



(NCTM, Principles to Actions, 2014)

Purposeful Questioning

Questioning

Individually reflect:

When you ask your students questions, what kind of responses do you get?

Purposeful Questioning

Classroom Reflection

Think-Ink-Share

1. **Think and Ink** in the Public Chat two questions that teachers frequently ask students.
2. **Share** your thinking by hitting send when prompted to do so.

Waterfall - post your response in Public Chat

Purposeful Questioning

Accessing Your File Cabinet

Principles to Actions: Pose Purposeful Questions (pp. 35-37)

File Cabinet:

In the upper right dropdown menu, click on the **File Cabinet.** Next choose **Building on Discourse.**
Select the tab **Virtual Learning.**
Click on the document **04 Principles to Actions: Pose Purposeful Questions (pp.35–37).**

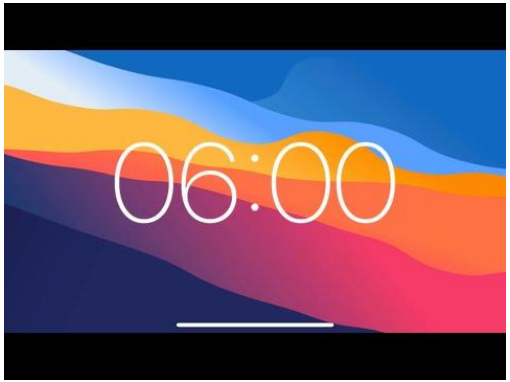
Purposeful Questioning

Notice & Wonder Reading Protocol

Individually read “Pose Purposeful Questions (pp. 35–37).” **As you read:**

What do you notice?

What do you wonder?



Purposeful Questioning

Patterns of Questioning – p. 37 of PtA

Common Patterns of Questioning

Initiate - Response - Evaluate	
Initiate	Teacher asks a question to gather information with a specific response in mind.
Response	Student responds.
Evaluate	Teacher evaluates the response.

Funneling	Focusing
Teacher engaged in cognitive activity.	Students engaged in cognitive activity.
Questions lead students through a procedure.	Questions guide students through their own thinking.
Students get the correct answer, but does not see the connection between the questions.	Teachers can understand what the student is thinking.

Purposeful Questioning

Types of Questions

Types of Questions:

1. Gathering information
2. Probing thinking
3. Making the mathematics visible
4. Encouraging reflection and justification

Which type of questions do teachers typically ask?

Connect to the waterfall questions regarding typical questions teachers ask.

Purposeful Questioning

Types of Questions

Types of Questions:

1. Gathering information
2. Probing thinking
3. Making the mathematics visible
4. Encouraging reflection and justification

Purpose is to ***assess*** student thinking

Purpose is to ***advance*** student learning

Purposeful Questioning

Assessing vs. Advancing Questions

Assessing Questions	Advancing Questions
+ Based closely on the work the students have produced + Clarify what the students have done and what they understand about what they have done + Provide information to the teacher about what the students understand *Teacher STAYS to hear the answer to the question.*	+ Use what students have produced as a basis for making progress toward the target goal of the lesson + Move students beyond their current thinking by pressing them to extend what they know to a new situation + Press students to think about something they are not currently thinking about *Teacher WALKS AWAY, leaving students to figure out how to proceed.*

Smith, Margaret Schwan., et al. (2017). *Taking action: Implementing effective mathematics teaching practices in grades 9-12.* NCTM. 12.

Purposeful Questioning

Effective Questioning Handout

Individual Task

1. **Open** the link from the Public Chat and go to page 2.
2. **Select** up to 5 questions that you **use most** frequently. **(1 min)**
3. From the questions you selected, determine if it is an **assessing or advancing** question. **(1 min)**

Purposeful Questioning Closure

Reflection on Learning Target and Success Criteria

Learning Target:

Understand how purposeful questioning can affect student learning.

Success Criteria:

1. Name the purpose of assessing and advancing questions.
2. Write assessing and advancing questions.

Agenda

Focus: Building on Discourse

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Closure

Session 3 Outcomes

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Closure

Rough Draft Thinking

Teacher

Use the Rough Draft Thinking space in your Action Plan (Day 2) to reflect on how purposeful questioning impacts student learning and discourse.

Action Plan:

In the upper right dropdown menu, click on the **Action Plans.**
Select **Discourse Action Plan**
Find the box titled **Rough Draft Thinking**
Click in the box to record your thoughts.

Closure

- Parking Lot will be addressed in Session 4
- Attendance

  Either scan the QR code

  OR

  Enter passcode in the Portal

  XXXXXX

- Homework: Get out your printed copy of the "Blank Monitoring & Circulation Chart" accessed in the File Cabinet.

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