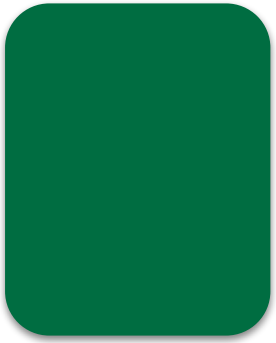
Building on Discourse Virtual – Session 4

Rev 5/31/23 (ce)

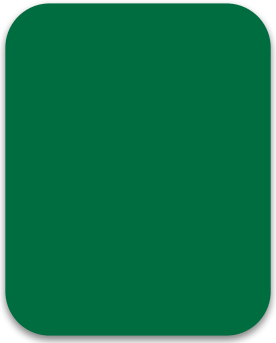
Welcome to Building on Discourse!

Session 4: Select and Sequence Student Work to Tell a Mathematical Story

Session Facilitators



Name



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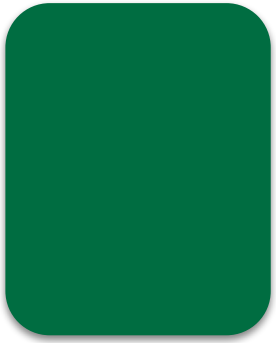
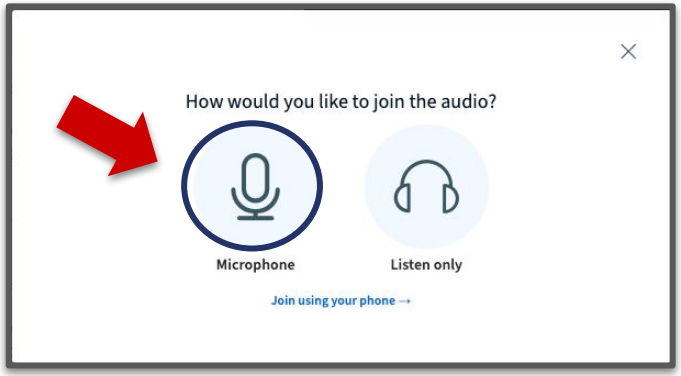
Support



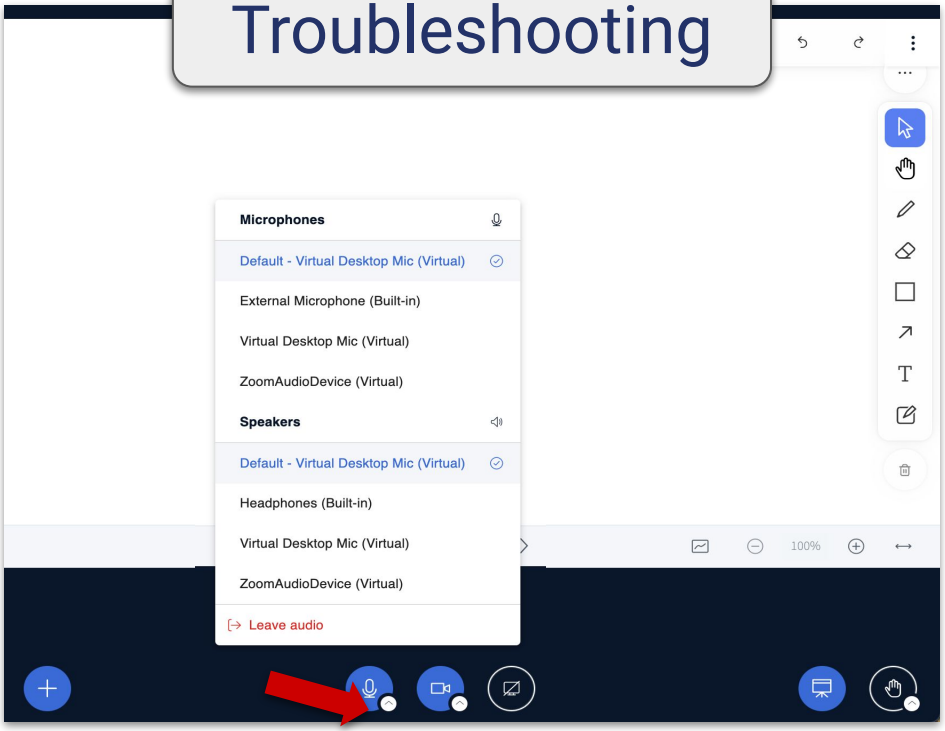
Regional Professional Learning Coordinator

Tech Tip

Audio



Troubleshooting



Opening

Session 4 Outcomes

Together we will:

+ Experience the Effective Mathematics Teaching Practices through the design of the *5 Practices*.
+ Better understand how facilitating meaningful mathematical discourse advances student thinking.
+ Intentionally select and sequence student work to establish a coherent mathematical storyline.
+ Gain strategies to implement the *5 Practices*.

Opening

Agenda – Session 4

Focus: Building on Discourse

- ☐ Icebreaker
- ☐ Monitoring
- ☐ Selecting & Sequencing
- ☐ Connecting
- ☐ 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

Session 4

Focus: Building on Discourse

- [x] Icebreaker
- [ ] Monitoring
- [ ] Selecting & Sequencing
- [ ] Connecting
- [ ] Closure

Agenda

Session 4

Focus: Building on Discourse

- [x] Icebreaker
- [x] Monitoring
- [ ] Selecting & Sequencing
- [ ] Connecting
- [ ] Closure

Monitoring

Focusing Learning

Learning Target:

Understand the importance of monitoring student thinking.

Monitoring

Connection to Prior Learning

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:**

Monitoring

Pause & Consider

Individually reflect. When you circulate among teams:

- What are you noticing?
- What are you looking for?
- How are you tracking students' ideas during instruction?

Monitoring

Monitoring – What?

2. Monitoring

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

(Smith, Steele, & Sherin, 2019)

Monitoring

Tracking Student Thinking

5 Practices Monitoring/Circulation Chart

Adapted from The Five Practices in Practice: Successfully Orchestrating Mathematics Discussions in Your High School Classroom, Smith, Steele, Sherin, Corwin 2020,
Used in CPM's Building on Discourse Learning Event

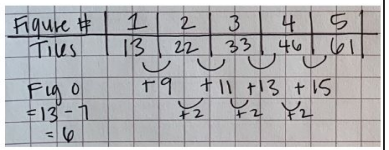
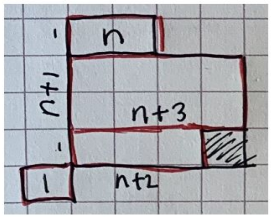
Lesson:

Anticipate Strategies	Assessing Questions	Advancing Questions	Who/Observation	Order
Anticipate the various strategies/methods students will apply to arrive at the solution.	*(Ask these when circulating during the lesson.)*	*(Ask these when circulating during the lesson.)*	Which student/team is using the strategy? (*Be mindful of creating equitable practices.*)	Sequence strategies aligned with the learning goal.

Monitoring

CC3 4.1.1 Tile Pattern Challenge Monitoring Chart

Lesson 4.1.1 Learning Goal: *Use different representations to make sense of and describe the tile pattern. Discover connections among the different representations.*

Anticipate Strategies Anticipate the various strategies/methods students will apply to arrive at the solution.	**Assessing Questions** *(Ask these when circulating during the lesson.)*	**Advancing Questions** *(Ask these when circulating during the lesson.)*	**Who/Observation** Which student/team is using the strategy? (*Be mindful of creating equitable practices.*)	**Order** Sequence strategies aligned with the learning goal.
Growing by consecutive odds 	What is the connection? Tell me how you are seeing the growth?	How do you see the growth in a graph or rule? How are the different representations connected?		
Horizontal Rectangles or rows 	How are you highlighting your connections?	How are you seeing the growth in the different representations? Can you represent this in a graph and table?		

Monitoring

Monitoring – How and What Tools?

Teacher actions that support effective monitoring are:

- Purposeful circulation path: “The Three Pass Promise.”
- STTS
- Pocket questions
- Team agreements
- Team roles
- Address teams vs individuals
- Others?

Monitoring

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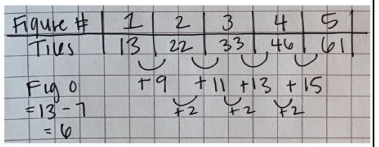
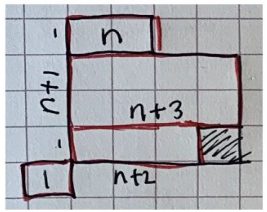
Growing by consecutive odds  	What is the connection? Tell me how you are seeing the growth?	How do you see the growth in a graph or rule? How are the different representations connected?	T1 - asked Q1AD T5 - Q2 AS, then Q1 AD	
Horizontal Rectangles or rows  	How are you highlighting your connections?	How are you seeing the growth in the different representations? Can you represent this in a graph and table?	T3, T4 T1 had this partly correct but asked Q2 AD	

Abbreviation Key

T1 - Team #
Q1 - Question Number
AD - Advancing Questions
AS - Assessing Questions

This is one possibility, use what works for you.

Monitoring

Reflection on Learning Target and Success Criteria

Learning Target:
Understand the importance of monitoring student thinking.

Success Criteria:

1. Identify the purpose of monitoring.
2. Explain how you can monitor student thinking while asking assessing and advancing questions.

Agenda

Session 4

Focus: Building on Discourse

- [x] Icebreaker
- [x] Monitoring
- [x] Selecting & Sequencing
- [ ] Connecting
- [ ] Closure

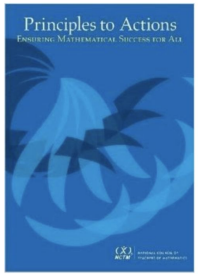
Selecting & Sequencing

Effective Mathematics Teaching Practice

Elicit and Use Evidence of Student Thinking

"Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning."

(NCTM, 2014)



Selecting & Sequencing

Focusing Learning

Learning Target:

Understand how the selecting and sequencing process builds a mathematical storyline to reach the learning goal.

Selecting & Sequencing

Selecting & Sequencing – What?

3. Selecting

+ The act of purposefully determining what mathematics students will have access to — beyond what they were able to consider individually or in small groups — in building their mathematical understanding. (Smith, Steele, & Sherin, 2020)

4. Sequencing

+ The process of determining the order in which students will present their solutions. The key is to order the work in such a way as to make the mathematics accessible to all students and build a mathematically coherent storyline. (Smith, Steele, & Sherin, 2020)

Selecting & Sequencing

Preview Student Work

Individually Preview the following student work samples:

CC3 Lesson 4.1.1. Tile Pattern Challenge
Student Samples A–E

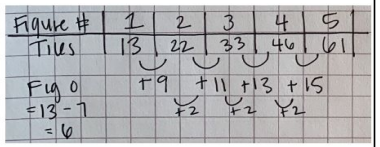
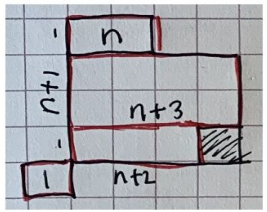
File Cabinet:
In the upper right dropdown menu, click on the **File Cabinet**.
Next choose **Building on Discourse.**
Select the tab **Virtual Learning.**
Click on the document **CC3 Lesson 4.1.1 Tile Pattern Challenge Student Samples A–E.**

Selecting & Sequencing

CC3 4.1.1 Tile Pattern Challenge Monitoring Chart

Teacher

Lesson 4.1.1 Learning Goal: *Use different representations to make sense of and describe the tile pattern. Discover connections among the different representations.*

Anticipate Strategies Anticipate the various strategies/methods students will apply to arrive at the solution.	**Assessing Questions** *(Ask these when circulating during the lesson.)*	**Advancing Questions** *(Ask these when circulating during the lesson.)*	**Who/Observation** Which student/team is using the strategy? *(Be mindful of creating equitable practices.)*	**Order** Sequence strategies aligned with the learning goal.
Growing by consecutive odds 	What is the connection? Tell me how you are seeing the growth?	How do you see the growth in a graph or rule? How are the different representations connected?	T1 - asked QIAD T5 - Q2 AS, then Q1 AD	
Horizontal Rectangles or rows 	How are you highlighting your connections?	How are you seeing the growth in the different representations? Can you represent this in a graph and table?	T3, T4 T1 had this partly correct but asked Q2 AD	

Selecting & Sequencing

Reflection on Learning Target and Success Criteria

"The key for me is that with selecting and sequencing, I can make sure that the goals are highlighted in a way that helps really create a story for the students."

—Cori Moran, HS Math Teacher

Learning Target:

Understand how the selecting and sequencing process builds a mathematical storyline to reach the learning goal.

Success Criteria:

1. Identify the purpose for selecting and sequencing.
2. Describe considerations for identifying student work during selecting.
3. Explain the importance of storyline to support the learning goal during sequencing.

Agenda

Session 4

Focus: Building on Discourse

- [x] Icebreaker
- [x] Monitoring
- [x] Selecting & Sequencing
- [x] Connecting
- [ ] Closure

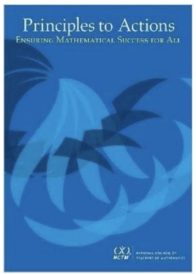
Connecting Student Solutions

Effective Mathematics Teaching Practice

Use and Connect Mathematical Representations

"Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving."

(NCTM, 2014)



Connecting Student Solutions

Focusing Learning

Learning Target:

Consider how a teacher's actions and decisions affect students connecting mathematical ideas to each other and to the lesson goal.

Connecting Student Solutions

Revisiting David Crane's Lesson

Successful or Superficial? Discussion in David Crane's Classroom

File Cabinet:

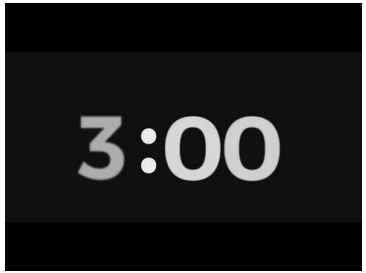
In the upper right dropdown menu, click on the **File Cabinet**.
Next choose **Building on Discourse.**
Select the tab **Virtual Learning.**
Click on the document **Successful or Superficial? Discussion in David Crane's Classroom.**

Connecting Student Solutions

Revisiting David Crane

Consider the following question as you **revisit** the article, “Analyzing the Case of David Crane (p. 5–6).”

According to the text, what matters during a connecting discussion?



Connecting Student Solutions

Revisiting David Crane

Teacher

Pairs Chat with your Icebreaker Team

Respond with your partner about the following question.

According to the text, what matters during a connecting discussion?

Facilitator & **Recorder/Reporter**

Task Manager & **Resource Manager**

Connecting Student Solutions

Connecting – What?

Teacher

Share **one statement** that your partner mentioned in your **Pairs Chat.**

Post your response in Public Chat.
Read through the posts.

Connecting Student Solutions

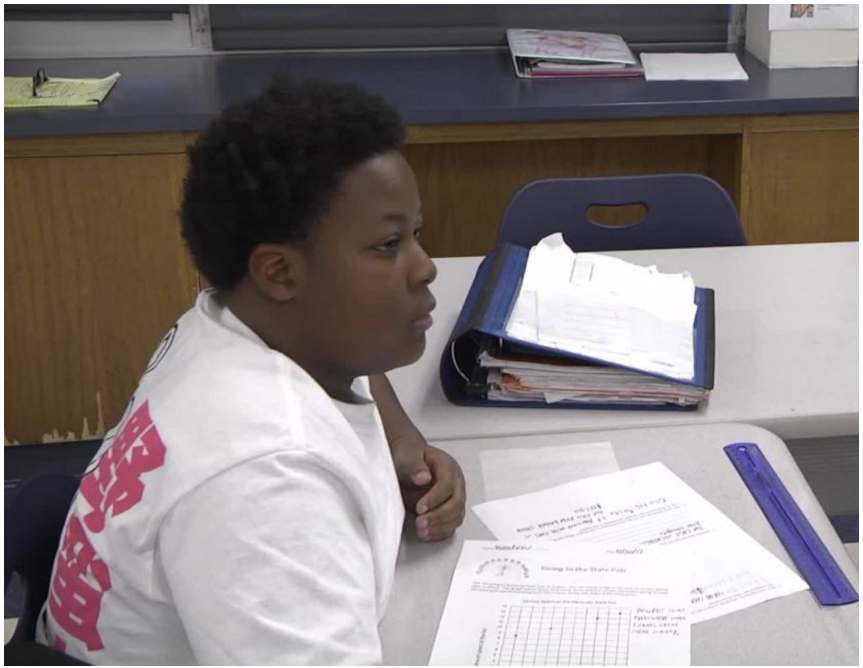
Connecting – How?

"Connecting involves **asking questions** that must go beyond merely clarifying and probing what individual students did and how. Instead, they must focus on mathematical meaning and relationships **and make links between mathematical ideas and representations.**"

Smith, M.S. & Stein, M. (2011). *5 Practices for Orchestrating Productive Mathematics Discussions.* Reston, VA. National Council of Teachers of Mathematics and Corwin. 70.

Connecting Student Solutions

Video 6.3 Connecting Different Solutions to Each Other



Teacher

As you watch the video, observe what the teacher is doing and asking.

What do you notice?

What do you wonder?

As you watch, post your notices and wonderings in the Public Chat.

Connecting Student Solutions

Challenges

Common Challenges in Connecting Student Solutions

- Whole class engagement and accountability.
- Staying focused on key mathematical ideas.
- Student voice vs teacher voice.
- Time.

Connecting Student Solutions

Teacher Moves Debrief

Teacher Moves	Purpose	Examples
Adding on: Prompting students for further participation.	Invite additional contributions to engage more students or gain deeper understanding.	Would someone like to add on to what she just said?
Waiting: Giving students time to think about the question.	Provide students time to gather their thoughts after being called on.	Take a minute to think about this. I am going to wait until I see more hands.
Revoicing: Repeating what a student said, then checking to make sure you captured their idea accurately.	Clarify what student said or amplify an important idea.	So, you are saying… So, here is what I heard you say…
Inviting: Asking a student to contribute in the discussion.	To make diverse points of view available for public discussion.	___, would you share what you and your group came up with? ___, you have a puzzled look on your face. What are you thinking?

Connecting Student Solutions

Reflection on Learning Target and Success Criteria

Learning Target:

Consider how a teacher's actions and decisions affect students connecting mathematical ideas to each other and to the lesson goal.

Success Criteria:

1. Explain the purpose for a connection discussion.
2. In the "Focus on Discourse On-Demand Module," you will Identify potential questions that would support students making connections in your rich task.
3. Describe the importance of storyline to support developing connection questions.

Agenda

Session 4

Focus: Building on Discourse

- ☑ Icebreaker
- ☑ Monitoring
- ☑ Selecting & Sequencing
- ☑ Connecting
- ☑ Closure

Closure

Focusing Learning

Learning Target:
Consider how the *5 Practices* support effective teaching.

Closure

Review

0. Selecting a rich task and writing a lesson goal
1. Anticipating
2. Monitoring
3. Selecting
4. Sequencing
5. Connecting

Closure

Reflecting on the *5 Practices*

Teacher

Give One, Get One Preparation

1. **Fold** a piece of paper into 6 parts and **label** each section:

   0 – Rich Task, Learning Goal
   1 – anticipate
   2 – Monitoring
   3 – Selecting
   4 – Sequencing
   5 – Connecting

2. **Take** a minute to think of your “aha”s, what you want to incorporate into your classroom, or “teacher moves.” List these in each section.

Closure

Reflection on Learning Target and Success Criteria

Learning Target:

Consider how the *5 Practices* support effective teaching.

Success Criteria:

1. Identify teacher moves that address the *5 Practices*.
2. In the On-Demand module, you will critique the effect of classroom culture on meaningful mathematical discourse.

Closure

Session 4 Outcomes

Together we will:

+ Experience the Effective Mathematics Teaching Practices through the design of the *5 Practices*.
+ Better understand how facilitating meaningful mathematical discourse advances student thinking.
+ Intentionally select and sequence student work to establish a coherent mathematical storyline.
+ Gain strategies to implement the *5 Practices*.

Closure

- Parking Lot
- Attendance & Feedback

  Either scan the QR code

  OR

  Enter passcode in the Portal

  XXXXXX

- Homework:
  - Complete Activity 2 prior to the start of Session 5.

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