# Virginia Department of Education 2018 Mathematics Institutes

# Facilitator’s Guide – Grade Band K-2

## 2018 Mathematics Institutes

The purpose of the 2018 Mathematics Institute is to provide teachers with professional development grounded in the implementation of the [2016 *Mathematics Standards of Learning*](http://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/index.shtml) to strengthen the teaching and learning of mathematics through facilitating meaningful mathematical discourse, to include: posing purposeful questions; eliciting and using evidence of student thinking; using and connecting mathematical representations; and supporting productive struggle in learning mathematics; as well as supporting equitable learning opportunities for all students.

## Professional Development Instructions

A product of the 2018 Mathematics Institutes is a set of online professional development modules designed to be used by a group of teachers of a specific grade level or course, facilitated by a member of the team. Modifications could be made to adapt the professional development for more than one grade level/course or for large groups. Facilitators should review the activities and handouts in this guide prior to facilitating this professional development.

| **Approximate Time** | **Facilitator Instructions** | **Materials** |
| --- | --- | --- |
| **65 minutes total** | **Module 1: Teaching Practice: Facilitating Discourse**  **Essential Questions:**  **What elements must be in place to support meaningful mathematical discourse?** |  |
| **25 minutes total**  1) Introductions, Agenda and Getting to Know you Activity  (10 min.)  2) Connect the Process Goals to the Mathematics Practices (15 min.) | 1. **Welcome and Introductions**  * Welcome and introduce facilitators. (Slides 1-2) * Have participants introduce themselves at their individual tables. Share their name, where they work and what grade they teach, or what their job is if they are not a classroom teacher. * Getting to know you Activity: That’s Me. Read each statement and instruct participants to “Stand if this refers to you” and say “That’s me!” (Slide 3-4) * Share agenda and special information such as location of restroom. (Slide 5) * Explain Parking lot poster: There is a “parking lot” hanging in the room for participant questions. Just write the question/concern on a sticky note and add it to the parking lot at any time during the presentation. (Slide 6) * Share goals and outcomes for the day. (Slide 7)  1. **Mathematics Process Goals** (Slide 8)  * Review the Mathematical Process Goals for Students in Virginia. These are the overarching goals for mathematics instruction in Virginia. It’s important to note that with the 2016 standards revision the mathematical process goals are still driving the mathematical understanding. Students will learn the math content through the process goals of problem solving, connections, communication, representations, and reasoning. “The content of the mathematics standards is intended to support the five process goals for students”.  1. **Effective Teaching Practices** (Slide 9)  * Explain that the 2016 Standards are supported by the process goals and the 8 Mathematical Practices from NCTM. Read each one and refer to the handout with descriptions. Then, discuss the following questions:   + What does this practice look like in a mathematics classroom?   + What are teachers doing?   + What are students doing?  1. **Making Connections** (Slide 10)  * As set up for this activity, hang the wall posters numbered 1 – 5 with the process goals around the room and place a different colored post-it note under each number. Hang up the large poster of the Principles to Action vs. Process Goals in the room. * As shared in the opening, the book that was purchased for each district (show book) has a chapter dedicated to each practice. Our work today will serve to think deeply about several of the practices as we fully implement the 2016 Mathematics Standards of Learning. This morning we will take a little time to explore how the practices and the process goals connect? * Have participants count off 1-5. (Each number represents a process goal.) * Have each small group move to a different area around the room. * Within the small group discuss whether there is a connection between the assigned process goal and each principle using the Principles to Action vs. Process Goal handout. If there is a connection place a check mark on the handout. * After the small group discussion is complete, place a colored post-it note on the large poster for each principle connected to the process goal.  1. **Teaching Framework for Mathematics** (Slide 11)   Explain that the practices are all important to a thriving math environment. This graphic shows how the practices are interconnected and support one another.   * Explain that the practices are all important to a thriving math environment. This graphic shows how the practices are interconnected and support one another. | * Grade Band K-2 Session PowerPoint * Parking lot poster * [Numbered wall posters 1-5](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/number-wall-posters.docx) * [Making the Connection Handout](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/making-the-connection.docx) (NCTM Practices/ VA Process Goals) * Post-it notes – in the five colors of the Mathematics Process Goals slide (pink, purple, orange, bright blue, light blue) |
| **40 minutes total**   * Establishing a Mathematics Community – 30 minutes * Review essential question with research and promoting equity – 5 minutes | 1. **Introduction to Facilitating Discourse in the K-2 Mathematics Classroom** (Slide 12)  * Revisit the Teaching Framework for Mathematics. The first practice that we will focus on is Facilitating Discourse. (Slide 13) * Share Essential Questions (Slide 14). Jot down a few ideas about the essential questions on a sticky note. Set them aside to revisit later.  1. **Which One Doesn’t Belong**  * Throughout our session today, we will engage you in Sense Making Activities that you will be able to take back and use with your classes. This first one is called Which One Doesn’t Belong? * Display Slide 15. Say: Consider which one does not belong and why? Think to yourself first, then when your neighbor is ready, share your thoughts with them. * Allow participants up to 3 minutes to think then share with their tables which picture doesn’t belong and why. * Facilitate sharing of thoughts as a whole group. (2 min.) * Display Slide 16, ask participants to repeat the process. * Facilitate sharing of thoughts as a whole group. * Ask: When might it be useful to do an activity like Which One Doesn’t Belong? Why is it useful? (If no one mentions it, share that it allows entry for all students into discourse and a mathematics community.) * There is a website that supports this sense making activity that will be shared at the end of this session.  1. **Establishing a Mathematics Community** (Slides 17-19)  * In order to have productive mathematical discourse, a strong mathematics community has to be established. What is a mathematics community? (Slide 17) * Using the Mathematics Community T-chart Handout, have participants record their thoughts related to what a math community is and what it is not. Write for 3 minutes. Share with table groups for 3 minutes. * Share the Mathematics Community slide (slide 18) and compare this with what participants brainstormed. * Show the video, [Language Supports for Number Talks](https://www.teachingchannel.org/video/sentence-frames-ousd). (Slide 19) Ask participants to reflect on the sentence frames that students used. What did they notice? * Hand out the Sentence Frames for Students Handout. Have participants reflect on the sentence frames. How might sentence frames help build a mathematics community? (slide 19)  1. **Closure and Reflection – Four Corners** (Slide 20-22)  * The resource that you are taking back to your schools/districts called *Taking Action* is dedicated to providing research and giving special attention to equitable practices for each of the Eight Teaching Practices. At this time we will analyze how facilitating meaning mathematical discourse is supported in the research and how it supports equitable teaching in the mathematics classroom. * The Research and Equity handout has 4 statements for Module 1. Use the Research and Equity handout to read and select one of the statements that strikes you as interesting. * Each statement has a number assigned to it. When the signal is given, each participant should go to the corner of the numbered quote that they wish to discuss. Pair up with a colleague in that corner and discuss your chosen statement. If time allows, have someone from each corner share their discussion highlights. * Have participants return to seats. * As we close this module, have participants revisit their “Jot Thought”. Can you make connections between your original thought and these quotes? Has your thinking changed at all? Share with a neighbor at the table and adjust with new thoughts as needed. * Use reflection sheet to reflect on the information discussed up to this point. | * [Mathematics Community T-chart](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/math-community-chart.docx) * [Question Stems –Sentence Frames Handout](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/quest-stems-sent-frames.docx) * [Teaching Practice Research and Equity Handout](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/tchg-prac-research-equity.docx) * [Reflection sheet](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/reflection-sheet.docx) |

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| **100 minutes** | **Module 2: Teaching Practice: Pose Purposeful Questions**  **Essential Questions:**   * **How can posing purposeful questions be used to inform instruction and assess student understanding?** * **How does posing purposeful questions promote equitable learning opportunities for all students?** |  |
| * Warm-up – 2 minutes * Vertical progression of computational fluency – 8 minutes * Examining Questions:   \* Caterpillar task with types of questions – 45 minutes  \* George’s Pattern Task with assessing and advancing questions – 40 minutes   * Review essential question with research and promoting equity – 5 minutes | 1. **Introduction** (Slide 23-25)  * Revisit the Teaching Framework for Mathematics. The practice that we will focus on in this module is Posing Purposeful Questions. * Share Essential Questions (slide 25). Jot down a few ideas about the essential questions on a sticky note. Set them aside to revisit later.  1. **Sense Making Routine: Agree or Disagree**  * Display Slide 26. * This sense making routine is called Agree or Disagree. For this example, there are two pictures of cubes on the screen. I’m saying that the picture on the left is the same as the picture on the right. Do you agree? Do you disagree? How are these representations alike? How are they different? Can you think of multiple ways that they are alike and different? Think to yourself. * For this activity, we’re going to use the idea of sentence frames to structure our dialogue. Each time you talk to your partner, you are going to start your conversation with “I agree that they are the same because….” or “I disagree because…” * You are going to take turns going back and forth with your partner, each sharing one idea until time is called. (Allow for two minutes of partner talk). * Share out several ideas whole group. * Reflect on the questions that you could ask as part of this activity to assess student understanding.  1. **Vertical Progression of Computational Fluency** (Slide 27)  * Review the progression document for K.4, 1.7, and 2.5. Break up in mixed grade level groups and discuss the following questions:   + What do students need to know?   + How do these standards connect?   + How does the progression of these standards build number sense?  1. **Examining Questioning** (slides 28 – 34)  * Present participants with the caterpillar task. (Slide 28) * Have participants take a few minutes to solve the task in at least two different ways. Ask them to consider strategies that a first grader might use and to draw pictures or representations of their strategies. * As you are working, we will be asking you questions, modeling how a teacher might ask questions as students work through the task. Please pay attention to the types of questions that we ask as you work through this task. * As participants are solving the task, walk around asking individual questions based on the participants’ representations. Sample questions include:   + Can you show me how you counted the fruit?   + I see you wrote 10 + 5 on your paper. Where did the 10 come from?   + What pattern do you see in these equations?   + What makes 10 + 5 equal to 9 + 6?   + Do you agree or disagree with this explanation? * The complete list of sample questions can be found on slides 31 and 32. * After participants have finished the task, have them share their solution strategies at their tables. Facilitators should continue to ask questions as groups are sharing. * As a whole group, reflect on the questions that were asked of them during the task and sharing of strategies. What do they notice about the types of questions that were asked? (Slide 29) * Share the five types of questions from *Taking Action* page 102. Discuss the purpose of each type of question. (Slide 30) * Have participants work with a partner to reflect on the strategies used to solve the caterpillar task. Use the Five Types of Questions document to record questions you would ask your partner about their work. * Share the Question Stems (slide 31) as resource for developing questions as students are sharing strategies. * Share the questions from the Caterpillar Task (slides 32 and 33*)*. Describe how these questions were scripted prior to completing the task. * If time allows, use the solution path examples from *Taking Action* on pages 99 and 106 to share purposeful questions leading to further learning. These solutions can be duplicated onto a larger piece of paper for the participants to see. The following questions pulled from the discussion boxes in *Taking Action,* can be utilized for each student (the teacher voice is in regular print, the student voice is italicized):   + Cole: How did you solve for the total number of pieces of fruit? *(I counted 4, 5, and 1 because that makes 10. Then I added 5 more.)* How many students understand what Cole did? Rosa, can you say back what Cole did in your own word?   + For Evan the same questions would be used as Cole. After the questions, the teacher says: Cole wrote 10+5 and he got 15 pieces of fruit. Evan said he solved 6+9 and he got 15 pieces of fruit too. How can both Cole and Evan each get 15 pieces of fruit when they each wrote and solved a different equation?   + Sophia: How many total pieces of fruit did the caterpillar eat? (*15*) How did you figure out that the answer was 15? (*I counted.)* Let’s all try that. Everyone count with me.   + Gabe: Tell us how you solved it. (*I counted 5+2+3 and that’s 10. Then I added 1 +4)*. So you first added 5, 2, and 3 and got 10. Then you added on 1 and 4 which is 5 more. So how many total pieces of fruit did you get? So everyone count with me to check Gabe’s work. He had 10 and then added 5 more. So let’s start counting at 10. 10, 11, 12, 13, 14, 15. So we can use counting all to find an answer like Sophia or a faster ay would be to use counting on to find the answer.  1. **Vertical progression of Patterns** (Slide 34)  * Review the progression document for K.13, 1.14, and 2.16. Break up in mixed grade level groups and discuss the following questions:   + What do students need to know?   + How do these standards connect?   + How does the progression of these standards build mathematical relationships?  1. **Patterns Task**  * Present the participants with another mathematical task: George’s Pattern utilizing the book Beep Beep, Vroom, Vroom! By Stuart Murphy. (slide 35) If book is available, read the book to introduce the task. * Discuss with table partners: What is the goal of this task? What are some ways that students may solve this task? What questions will you ask to support student exploration of the task? What questions will you ask to bridge from what students did to the mathematical ideas you want them to know and understand? * Use the George’s Pattern task handout to record questions that are generated. Participants should reference the Five Types of Questions handout to assist with generating a variety of questions.  1. **Assessing or Advancing Questions**  * Examine characteristics of assessing and advancing questions (slide 36) * Now we want to revisit your questions through a lens of Advancing and Assessing student understanding. * Look back at your questions, write advance or assess by each one. Share with a partner. * Allow a few participants to share an example of each assessing or advancing questions.  1. **Closure and Reflection – Four Corners** (Slides 37-39)  * The resource that you are taking back to your schools/districts called *Taking Action* is dedicated to providing research and giving special attention to equitable practices for each of the Eight Teaching Practices. At this time we will analyze how facilitating meaning mathematical discourse is supported in the research and how it supports equitable teaching in the mathematics classroom. * The Research and Equity handout has 4 statements for Module 2. Use the Research and Equity handout to read and select one of the statements that strikes you as interesting. * Each statement has a number assigned to it. When the signal is given, each participant should go to the corner of the numbered quote that they wish to discuss. Pair up with a colleague in that corner and discuss your chosen statement. (If time allows, have someone from each corner share their discussion highlights. * Have participants return to seats. * As we close this module, have participants revisit their “Jot Thought”. Can you make connections between your original thought and these quotes? Has your thinking changed at all? Share with a neighbor at the table and adjust with new thoughts as needed. * Use reflection sheet to reflect on the information discussed up to this point. | * [Computational Fluency Progression](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/k-4-1-7-2-5-vert-progression.docx) (SOL K.4, 1.7, and 2.5) * [Caterpillar Task](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/caterpillar-task.docx) * [Five Types of Questions handout](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/five-types-of-questions.docx) * [Pattern Progression](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/k-13-1-14-2-16-vert-progress.docx) (SOL K.13, 1.14, and 2.16) * [George’s Pattern Task](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/georges-pattern-task.docx) * [Reflection Sheet](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/reflection-sheet.docx) |

| **Approximate Time** | **Facilitator Instructions** | **Materials** |
| --- | --- | --- |
| **65 minutes total** | **Module 3: Teaching Practice: Elicit and Use Evidence of Student Thinking**  **Essential Questions:**   * **How can eliciting and using evidence of student thinking be used to inform instruction and assess student understanding?** * **How does eliciting and using evidence of student thinking promote equity in the mathematics classroom?­** |  |
| * Warm-up – 2 minutes * Intentional Advance Planning template– 10 minutes * Vertical progression of fractions – 8 minutes * Grade Level Task activity – 40 minutes * Review essential question with research and promoting equity – 5 minutes | 1. **Introduction** (Slides 40-42)  * Revisit the Teaching Framework for Mathematics. The practice that we will focus on in this module is Eliciting and Using Evidence of Student Thinking. * Share Essential Questions (slide 42) Jot down a few ideas about the essential questions on a sticky note. Set them aside to revisit later.  1. **Sense Making Routine – Alike and Different**  * Display slide 43. * Ask participants to tell a partner how the two pictures are alike and how the two pictures are different. * Encourage participants to share multiple ways that the pictures are alike and different. * What mathematics topics emerged as part of the conversation about the two pictures? If fractions was not offered as one of the ideas, ask how fractions could be included in the discussion. The pictures in this particular sense making routine were selected to elicit student thinking about the topic of fractions.  1. **Ambitious Teaching**  * Share/discuss the idea of ambitious teaching - *Taking Action* pages 4 – 7. (Slides 44-45) * Read the quote and emphasize the red text on slide 44. Ask how does this link back to building a math community? * Read the goal of ambitious teaching. How do these ideas link to the practices and the process goals?  1. **Intentional Advance Planning** (Slides 46-47)  * Briefly discuss how teachers have to plan ahead in order to make sure to ask intentional, purposeful questions that elicit and assess thinking. Listening to what students say, observing their actions, and analyzing their written work are all ways for a teacher to gather information on what students know and understand. Effective mathematics teaching uses this evidence of student thinking as a basis for making instructional decisions. * Use slide 46 to define intentional advance planning. * Introduce the Intentional Advance Planning template. Discuss the purpose of each component of the template. (Slide 47) * Mathematics leaning goals – What understandings will students take away from the lesson? * Evidence of Student Thinking – What will students say, do, and produce that will provide evidence of their understandings? * Instructional Support – What tools or resources will be made available to give students entry to, and help them reason through the activity? * Prior Knowledge – What prior knowledge and experiences will students draw upon in their work with this task? * Anticipated solution paths, assessing questions, advancing questions * Planning for Class Discussion: Selecting and Sequencing - Which anticipated approaches and solution paths do you want students to share and compare? In what order? Why? * Planning for Class Discussion: Connecting Responses - What specific questions will you ask so that students make connections among the presented solution paths and make sense of the mathematical ideas you want them to learn? * In a few moments, we will use this Intentional Advance Planning Template to plan for implementing a fraction task. First, we’ll explore the fraction progression and some sample tasks.  1. **Vertical progression of Fractions** (Slide 48)  * Review the progression document for K.5, 1.4, and 2.4. Break up in mixed grade level groups and discuss the following questions:   + What do students need to know?   + How do these standards connect?   + How does the progression of these standards build understanding of fractions? * Have participants move to sit with their grade level peers. * Intro each grade level task. Review the Intentional Advance Plan template. (Slides 49-50) * Participants should solve the task, recording their thinking in the first box of the template. They should also record any assessing or advancing questions that they may want to ask students who might use that strategy. * Participants should continue thinking of other possible solution paths along with the assessing and advancing questions for those paths. * As participants work, display slide 51 as a reminder of the difference between assessing and advancing questions. * As a grade level group, record some anticipated solution paths on a poster to share with the other participants working on another grade level task. Next to each anticipated solution path, participants should also record assessing and advancing questions. * After all grade level groups have completed the task, have all participants do a gallery walk.  1. **Kindergarten – The Sandwich Task**  * Kyle and Mark made a sandwich. How many different ways can they cut the sandwich so that they both get equal shares? Explain your thinking using pictures, words, and symbols.  1. **First Grade – The Brownie Task – *Taking Action*, page 110**  * There are 7 brownies. Four friends are sharing the brownies so that everyone gets exactly the same amount. How much of the brownies will each friend get? What do you call that amount?  1. **Second Grade – The Half of a Whole Task**  * Identify all of the figures that have one-half of it shaded and be prepared to explain and justify how you know that one-half of the figure is or is not shaded. Write a description giving your reasons why each figure is or is not showing halves. * Reflection of the Intentional Advance Planning Process (slide 52)   + As a whole group discuss the intentional advance planning process.     - How did you feel coming up with multiple solutions to the task?     - Which components were easier to complete?     - Which were more difficult?  1. **Closure and Reflection – Four Corners** (Slides 53-54)  * The resource that you are taking back to your schools/districts called *Taking Action* is dedicated to providing research and giving special attention to equitable practices for each of the Eight Teaching Practices. At this time we will analyze how facilitating meaning mathematical discourse is supported in the research and how it supports equitable teaching in the mathematics classroom. * The Research and Equity handout has 4 statements for Module 3. Use the Research and Equity handout to read and select one of the statements that strikes you as interesting. * Each statement has a number assigned to it. When the signal is given, each participant should go to the corner of the numbered quote that they wish to discuss. Pair up with a colleague in that corner and discuss your chosen statement. If time allows, have someone from each corner share their discussion highlights. * Have participants return to seats. * As we close this module, have participants revisit their “Jot Thought”. Can you make connections between your original thought and these quotes? Has your thinking changed at all? Share with a neighbor at the table and adjust with new thoughts as needed. * Use reflection sheet to reflect on the information discussed up to this point. | * [Intentional Advance Planning Template](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/intent-adv-plan-temp.docx) * [Fraction Progression](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/k-5-1-4-2-4-vert-progress.docx) (SOL K.5, 1.4, and 2.4) * Poster paper and markers * [Kindergarten – The Sandwich Task](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/the-sandwich-task.docx) * [First Grade – The Brownie Task](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/the-brownie-task.docx) * [Second Grade – The Half of a Whole Task](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/half-of-a-whole-task.docx) * [Reflection Sheet](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/reflection-sheet.docx) |

| **Approximate Time** | **Facilitator Instructions** | **Materials** |
| --- | --- | --- |
| **100 minutes total** | **Module 4: Taking Action**  **Essential Question: How will you plan to implement tasks to facilitate meaningful mathematical discourse?  How will you share this information with others?** |  |
| * Putting it all together – 18 minutes * Math talk learning community – 60 minutes * Resources – 10 minutes * Review essential question with research and promoting equity – 10 minutes | 1. **Introduction** (Slides 55-57)  * Revisit the Teaching Framework for Mathematics. The practice that we will focus on in this module is Facilitating Meaningful Mathematical Discourse. (slide 56) * Share Essential Questions (slide 57)  1. **Putting it All Together**  * Give participants a chance to read quote on slide 58. * Table talk – Review the following points as they relate to strengthening the teaching profession for mathematics: (Slide 59) * The eight effective mathematics teaching practices * Ambitious teaching – thoughtful and thorough lesson planning * Deliberate reflection – was what was taught learned? * Equity – every student is learning mathematics with deep understanding. We discussed that it is necessary to build a math community. We will now look specifically at the important components of a math talk learning community.  1. **Components of a Mathematics Learning Community** (*Taking* Action pages 154-159)  * What are the components of a math talk learning community? (slide 60) *Taking Action* pages 154 – 159. * Identify the five components when analyzing mathematical discourse: Teacher role, Questioning, Explaining mathematical thinking, Mathematical representations, and Building student responsibility within the community. * What is the teacher’s role? * Who asks the questions? * Who provides the explanations? * How do mathematical representations support discourse? * How are students sharing responsibility for learning? * Follow the directions for preparing the sort (found on page 1 of the sort handout). * With each color, copy the headings and levels 0 – 3 on the same colored card stock. Copy each component description on different colored card stock. (You should have 6 colors total.) graphic of sorting activity * Give each table group a set of the headings and level numbers. * Give each table a copy of the first component: Teacher role. * Have the participants put the level descriptors in order. * After the group has finished their order, discuss the correct order. * What does this look like in your classroom? What are some ideas to move towards a level 3 with the Teacher’s role? * Repeat with each component; passing out the descriptors, allowing time to sort, and then discuss the correct order with the probing questions. Display one slide at a time to share the correct answers and discuss highlights of different levels and roles. (Slides 61-66)  1. **Resources** (Slide 67)  * 2016 Mathematics Standards of Learning – Instructional Resources * Share the resources currently available on the VDOE mathematics website. Pay special attention to the newest additions: Vocabulary Word Wall Cards – 2016 SOL; Mathematics Instructional Plans (formerly ESS lessons) correlated to 2016 SOL; and Mathematics Instructional Videos * Share resources for initiating student engagement. (Slide 68) * How did the opening of each module (sense making routine) get you ready to learn?  1. **Closure:**  * Use the Taking Action Reflection Sheet to revisit the essential questions: * How will you plan to implement tasks to facilitate meaningful mathematical discourse? * How will you share this information with others? (slide 69) * Thinking back to each module, how will you share this information with others? Use the reflection sheet to document ideas; thinking back to the tasks that were completed. * Module 1 – Facilitating Mathematical Dis course – establishing a mathematics community * Module 2 – Posing Purposeful Questions – Caterpillar Task & George’s Pattern Task * Module 3 – Eliciting and Using Evidence of Student Thinking – The Sandwich Task, The Brownie Task, and the Half of a Whole Task * Use the Stand Up, Hand Up, Pair Up structure for participants to share the ways in which they plan to share this information with others. Participants stand up with their reflection paper and hold their right hand in the air. When instructed to do so, they move around the room high fiving the other participants. After about a minute, instruct the participants to stop and partner with the person they just high fived. They share their strategies for how they will implement tasks and facilitate meaningful mathematical discourse. This process is repeated one or two additional times so that participants can gain an understanding of how others are sharing with teachers in their schools and divisions. * Share VDOE contact information. (Slide 70) | * [Classroom Discourse Sort](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/3-5/clssrm-discourse-sort.docx) * [Levels of Classroom Handout](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/levels-of-class-discour.docx) * [Taking Action Reflection Sheet](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/2018/k-2/reflection-taking-action.docx) |