IMPLEMENTING THE MATH WORKSHOP MODEL: TECHNIQUES AND BENEFITS

By

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A capstone project submitted in partial fulfilment
of the requirements for the degree of Master of Arts in Education.

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This project is a series of information and materials for four professional development sessions. It was initially created with the intent for a second grade professional learning community (PLC) team, but could be adapted to be used across primary and secondary levels within an elementary school setting. This project was created for two primary purposes: to inform educators on the past methods used to teach math that are no longer effective, and to provide insight on a new method that directly aligns with successful student learning strategies. This project will act as initial training in The Math Workshop Model for many teachers. The research question that helped support this project states: *what are the necessary components of professional development to support second grade teachers in implementing math workshop?*

The project is held in a Google Slides presentation. Speaker notes are provided to assist in the delivery of materials for each session. Each session was created with a 50 minute time block in mind. Each session addresses the purpose behind the meeting, what information the audience can expect to learn, and detailed slides providing such information. The layout of the four sessions is similar, which will provide a sense of familiarity for the audience from session to session. In each session, there are opportunities for educators to ask questions, receive feedback, and gain support in necessary areas. Time is allotted at the end of each session for reflection and questions going forward.

The Math Workshop Model implementation process is a new method to teaching math. Much of the information held within each session may be the first exposure audience members have to this method. In session one, educators will learn about past methods used to teach math and research that supports that these methods are no longer effective ways for students to learn. The audience will also receive an overview of The Math Workshop model and what’s to come for the next three sessions. The second session focuses primarily on the beginning steps to
implementation for week’s one and two. Within the slides, the audience will become more familiar with the necessary steps to introduce to their students the first and second week of using the workshop model. The third session reviews week’s one and two implementation process, and dives deeper into weeks three and four and the necessary items to be implementing in the classroom during that time. The final session reviews week’s three and four and focuses on each component that makes up The Math Workshop Model.

This project is heavily influenced by the work of Dr. Nicki Newton, an expert in effective ways students learn math and using The Math Workshop Model. Newton describes the importance of using the workshop model and how this method has changed the way that a math classroom functions. Newton (2014), suggested that throughout this strategy, students collaborate and learn about math in a space that is invigorating, rigorous, and standards based. As a result of using the collaborative, math workshop model, it has shown to be effective because of how it allows students to produce positive mathematical behaviors (how people act as mathematicians), model mathematical thinking (engage their minds with mathematical concepts and talk about what they know), and foster a productive disposition (how people see themselves as mathematicians and how motivated they are to engage in mathematical concepts).

Using this project in a professional learning community setting will allow educators to explore the ideas behind the purpose of implementing The Math Workshop Model and provide a space where educators can feel comfortable being out of their comfort zone and to ask questions as needed throughout each session. The implementation process of this model can tend to be overwhelming, especially for veteran teachers who have taught mathematics in a similar format for years. This project allows educators to gain insight and a step-by-step approach to stopping the less effective methods and moving towards a workshop model.
It is my hope that this project helps with the initial foundation of understanding the intent behind using The Math Workshop model and to help the transition occur in classrooms to better meet the mathematical learning needs of students. I am hopeful that by using this project as an introductory step, more educators will be interested in attending informational sessions about The Math Workshop Model in the future or that more professional development revolving around the workshop model will become top priority for schools and teachers.

Project link to slide presentation:

https://docs.google.com/presentation/d/e/2PACX-1vTZ1u_5unUzox2zXIrrMbHDKwWuw8FaT4PxIHYtcccc024D--qly9-kEqGdfmMZrC4P8w3Gdj9sCnNGF/pub?start=false&loop=false&delayms=5000
References

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**Slide 19:**


**Slide 21:**


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Slide 28:

Newton, N. We pose and solve word problems! Retrieved on October 18, 2018 from https://books.google.com/books?id=Zw0XCgAAQBAJ&pg=PP14&lpg=PP14&dq=nicki+newton+week+by+week+math+workshop&source=bl&ots=d_yw3y_LmU&sig=vpezMqVjm1id_GGhlMjYnR99zw&hl=en&sa=X&ved=2ahUKEwiok7-f7JDeAhUCr4MKHTF9ABMQ6AEwF3oECAUQAQ#v=onepage&q=nicki%20newton%20week%20by%20week%20math%20workshop&f=false.

Slide 29:

Middendorf, N. Solving Strategies. Retrieved on October 18, 2018 from Nicole Middendorf’s 2nd grade classroom at Thomas Lake Elementary School.

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Math Workshop Model: Session one

Understanding how students best learn math and the necessity of implementing The Math Workshop model in classrooms.

- Meeting time: approximately 50 minutes (the given time allotted for PLC's each week)
- Welcome all members of the group
- Address norms and meeting agreements (made at the first team PLC meeting of the year)
- Give outline of today's session/what to expect
- Have paper set up at each table prior to the start for questions
- Have a box to put questions by the door prior to the start for the folded pieces of paper
Outline of today’s session

- Understand the why and purpose of the next 4 sessions
- Take a peak at “outdated” or past methods used to teach math
- Learn about how students best learn math
- Share research behind the positive impact of student learning through the methods used during math workshop
- Closing/Reflection of today’s session
- Learn what questions you have prior to learning about implementing The Math Workshop model in order to best cater these sessions to you

- Ensure the audience knows what they can expect to learn and gain from today’s session
- Ensure the audience knows (especially veteran teachers) that past methods are nothing to be ashamed of, but that teachers are moving away from them because of the new research and understanding of effective ways to teach students math
- Explain that there will be time at the end to hear questions from today’s session and to gather future questions to guide the next sessions content to meet the needs of the present teachers
**Why are we here?**

- To better understand how we, as educators, can better meet the learning needs of our students during math periods
- Shift from “outdated” methods to more effective methods of teaching math
- Understand (prove) solid research supporting the Math Workshop model
- What’s the purpose?
  - Hear what questions you have and what you are interested in learning about regarding The Math Workshop model

**What’s the purpose?**

- The Math Workshop model has significant, positive research to reinforce the need to implement it in classrooms.
- These sessions will allow teachers to gain insight on what The math Workshop model is AND how to implement model into their classroom, while also providing support throughout the process
  * depending on the district, not all teachers receive training on the workshop model, so this may act as the only introduction and teaching sessions for some teachers

- Pause: give 1-2 minutes of reflection/time to think for teachers to gather any questions they have about TODAY’S session before moving forward to ensure all goals are clear and purposeful
  * there will be time at the end to gather questions regarding future sessions at the END of today’s session
Outdated/past methods used to teach math

Visual representations that might come to mind:

- Overhead projectors
- Chalkboard/whiteboard lectures
- Textbook questions used for daily assignments

- Explain how these might be some common themes that teachers might be thinking of initially when hearing the sentence, “outdated or past methods used to teach math” … especially for the more experienced/veteran teachers
- Explain how some teachers might not know or have experience with any of these methods, such as the newer teachers.
- At the time, this is what was used because these were the available resources. Now things are much more progressive with technology and curriculum materials
Outdated/past methods used to teach math

- Most people will picture a teacher lecturing, students taking notes, and then completing an assignment out of a textbook when thinking about a typical math classroom (Buchman, 1990).

- This teaching practice shows the textbook to be the authority – “theorems are proved by coercion – not reason – and confusions are addressed by repeating the steps in ‘excruciatingly fine detail’.”

- The Stodolsky study

- “Tell vs. Teach”

- The first statement comes from Buchman, state in Ball (see reference page). Discuss in detail how this research was pulled from a survey that asked people to share what they picture in a math classroom or what their personal experiences were when it came to how they learned math.

- Students in the past learned more from the textbook than they did their teachers - the textbook drove the instruction and learning methods for students.

Stodolsky Study:
- He studied 20 classrooms - in 90% of those classrooms, most of the math time was spent on whole-group instruction, not necessarily meeting the differentiated needs of all students.
- If time remained at the end of the whole group instruction time, students worked on an assignment in a textbook at their own pace. The rest would be left for the student to complete at home.

- Most teachers would tell students how to solve mathematical problems, not teach them.
Consequences of past methods

- “Tell vs. Teach”

- Textbook approach reduced room for additional mathematical concepts

- Inadequate examples for understanding

- Reduced use of manipulatives or concrete experiences to explore mathematical concepts

- Inhibited open-mindedness and disabled ways of looking

**Take away:** These methods and experiences can therefore limit possibilities for continued learning.

- The teach vs. tell method lead to less problem solving skills being developed for students
- Teachers heavily relied on teaching through the textbook, which hindered teachers to teach material that wasn’t covered in the textbooks, leading to failure to learn necessary content for students
- Textbooks also only showed 1-2 examples for mathematical concepts, reducing understanding for students learning
- Teaching from the textbook allowed for little to no use of manipulatives or other concrete experiences for students to learn and explore mathematical concepts to develop deep understanding
- Instead - students spent most of their time doing written practices and problems from their textbook
- These experiences inhibited open-mindedness, froze ways of looking, and/or engendered undesirable attitudes
HOW STUDENTS BEST LEARN MATH

Visual representations that might come to mind:

Hands on math stations  Math manipulatives  Guided math/small group instruction

- Explain how these might be some common themes that teachers might be thinking of initially when hearing the new, innovative ways students best learn math
- Explain how some teachers might not know or have experience with any of these methods, such as the more veteran/experienced teachers
- Explain how younger teachers/new teachers might have learned math using such ways, and it may be natural for them to vision these ways
How students best learn math

- Provide a positive and engaging experience - featuring play-like, adult-child interactions through whole group and small group/free choice instruction

- Educational technology

- The Math Workshop model

- Play-like/interaction learning opportunities can be provided during both structured learning activities (e.g. whole group math instruction), and unstructured activities (e.g. free choice math games in stations).
- Educational technology has also been long recognized as a valuable approach to improving student learning and reaching mathematical achievement of elementary school children.
- The workshop model allows math to come alive by considering the powerful impact of building a community of mathematicians who make meaning of real math together.
  "we will get into what this means and how it impacts student learning later on - just want to point out that it is a way that students best learn math."
Positive effects on student learning:
The outcomes from the effective ways students learn math

- Whole group and free choice math benefits
  Whole group/free choice
  - math games
  - stations (free choice time)
  - guided math (small group instruction)
  - use of hands on learning (manipulatives)

- Educational technology benefits
  Math apps
  - personal pace
  - immediate feedback about personal performance

- When these methods are used, research shows that students are more likely to fully grasp and understand the presented concepts.
- Technology influences the mathematics that is taught and enhances students’ learning
- Math apps allow students to work on math problems at their own pace, which can be particularly useful for struggling students who need more time to solve a problem.
- Math apps can also provide immediate feedback to individual learners about their performance, which would otherwise be difficult to achieve during general instruction
Positive effects on student learning: 

The outcomes from the effective ways students learn math [continued]

The Math Workshop model benefits

**Variety**
- allows for collaboration
- encourages rigorous instruction/activities
- productive production of mathematic behaviors
- allows students to talk about math
- encourages students showing what they know
- builds confidence, flexibility, perseverance, interest, creativity,

**Take away:** These teaching methods and learning strategies for students becomes critical when looking at success rates and developing necessary skills as mathematicians.

- The Math Workshop model works best for students because it focuses on groups of children learning and working together throughout the year in a structured instructional format. It allows for individual, partner, and small-group work.
- Mathematic behaviors: how people act as mathematicians, model mathematical thinking (engage their minds with mathematical concepts and talk about what they know), and foster a productive disposition (how people see themselves as mathematicians and how motivated they are to engage in mathematical concepts)
- All skills built are crucial to develop the necessary skills to be a successful mathematician, student, and learner.
**CLOSING: REFLECTING ON TODAY’S SESSION**

- This WILL BE overwhelming and it’s OKAY!

- Today’s purpose/intent

- Moving forward: providing transitional information and support on implementing weeks 1 and 2 into the classroom

- Restate that new learning is always overwhelming and the intent is to broaden perspectives and deepen understanding - NOT to make teachers feel bad if they are using old methods to teach math
- Today’s purpose was to provide information on past methods used to teach math and why it’s important to move away from these as well as information and research on how students best learn math and the benefits of using these ways
- Going forward: these sessions will help all teachers make the transition from past methods to The Math Workshop model while providing support
Questions/Wonderings for future sessions

- What questions, wonderings, comments, or concerns do you have about The Math Workshop model that can help shape our next session?

Before you go…

1. Write down on paper provided on your table spot (name is not required)

2. Fold - then put in the box by the door on your way out

A peak at next week’s session: implementing weeks 1 and 2 into your classroom

- Have paper set up at each table prior to the start for questions
- Have a box to put questions by the door prior to the start for the folded pieces of paper
- Explain that staff is free to go after they have completed their question(s)
Math Workshop Model:
Session two

Understanding the implementation process for weeks 1-2.

- Meeting time: approximately 50 minutes (the given time allotted for PLC’s each week)
- Welcome all members of the group
- Address norms and meeting agreements (made at the first team PLC meeting of the year)
- Give outline of today’s session/what to expect
- Have paper set up at each table prior to the start for questions
- Have a box to put questions by the door prior to the start for the folded pieces of paper
**Outline of today’s session**

- Review from last week’s session
- Understand the *why* and *purpose* of today’s session
- Layout of implementation process
- Dive deep into implementing weeks 1-2 into your classrooms
- Closing/Reflection of today’s session
- Learn what questions you have prior to learning about implementing The Math Workshop model week’s 3-4 in order to best cater the next session to you

- Ensure the audience knows what they can expect to learn and gain from today’s session - what the implementation process looks like and diving deep into weeks 1-2
- Explain that there will be time at the end to hear questions from today’s session and to gather future questions to guide the next sessions content to meet the needs of the present teachers
**WHY ARE WE HERE?**

- To better understand how we, as educators, can better meet the learning needs of our students during math periods

- Look at the overall outline of implementing The Math Workshop model in your classrooms

- Understand week’s 1-2 implementation

- Hear what questions you have and what you are interested in learning about regarding The Math Workshop model

- The Math Workshop model has significant, positive research to reinforce the need to implement it in classrooms.

- Today’s session will allow you to take a look at what’s to come for the weekly outline of implementation, as well as an in depth look and support at implementing weeks 1-3 into classrooms

- Pause: give 1-2 minutes of reflection/time to think for teachers to gather any questions they have about TODAY’S session before moving forward to ensure all goals are clear and purposeful

  * there will be time at the end to gather questions regarding future sessions at the END of today’s session
SNAPSHOT OF LAST WEEK’S SESSION

- Last week we learned:

  The past methods used to teach students math
  - projectors, lectured based instruction, textbook teaching

  The researched based effects (negative impact) those methods have on student learning
  - reduced room for additional mathematical concepts, inadequate examples for understanding, reduced use of manipulatives, inhibited open-mindness and disabled ways of looking

- Use info on slides to review last weeks learning - no need to go into depth, just lightly touch upon what was learned to get ideas fresh in audience’s minds
Methods that work best for student learning in math
- whole group and free choice math, educational technology, The Math Workshop model/variety

The research based benefits of these methods on student learning
- engages minds with mathematical concepts
- allows students to talk about and show what they know
- immediate feedback on student progress
- allows for hands on learning
- develops confidence in mathematical areas

- Use info on slides to review last week’s learning - no need to go into depth, just lightly touch upon what was learned to get ideas fresh in audience’s minds
“Start today.  
Start small.  
Be confident.  
Do it step by step.”

- Dr. Nicki Newton

- Let teachers know that the next slides WILL be overwhelming and that the MOST IMPORTANT thing to remember is to do it in babys steps - start small and work your way towards the intended outcome
Overview of implementing the Math Workshop Model

**Week 1:** Beginning the Journey

**Week 2:** Learning to Persevere, Reason, and Talk Mathematics

**Week 3:** Showing What You Know and Double Checking It

**Week 4:** Introducing Math Workstations and the Guided Math Groups

- Explain that this is the broad overview of what each week’s implementation focuses on
- Today’s session just focuses on weeks 1-2
**Week 1: Beginning the Journey**

- Math workshop is a structure for teaching and learning math
- Introduce workshop model (looks, sounds, feels like)
- Teach how to be and work as a mathematician
  *math community
- Whole group discussion expectations
- Working together respectfully all year long to learn math

**Focus on:** communication and participation

- Go over each item that is discussed during week 1
- Ask for any clarification/questions - let teachers know visuals and more in-depth explanations are coming
- Creating a math community is CRITICAL for a successful math workshop
- State that overall, this week focuses on ways to communicate during math time and the expectations for participation
Math workshop

Create an anchor chart on what math workshop looks like, feels like, and sounds like

- Explain how this anchor chart will set the foundation for your classroom’s workshop time
- Use time during a mini lesson to create this anchor chart - getting feedback and ideas from students (whole group)
- Anchor charts should be created and displayed to remind students of information and expectations
Creating a Math Community

Example of anchor chart for creating a math community

- Go over some of the components on the poster.
- Address that during the first week, you can use mini lessons to talk about a math community and what that might entail.
- Anchor charts should be created and displayed to remind students of information and expectations.
Example of how to explain to students what a great mathematician does and looks like

- Go over some of the components on the poster.
- Address that during the first week, you can use mini lessons to talk about what mathematicians do and why it's important to be a great mathematician.
- Anchor charts should be created and displayed to remind students of information and expectations.
Respect and Manners

Example of how to explain to students that respect and manners will make an impact on math workshop time.

- Go over some of the components on the poster.
- Address that during the first week, you can use mini lessons to talk about how students will be learning together all year long, so learning how to do that respectfully with make a big difference.
- Talk about how students should talk to each other and how they can learn together.
- Anchor charts should be created and displayed to remind students of information and expectations.
WEEK 2: LEARNING TO PERSEVERE, REASON, AND TALK MATHEMATICS

- Introduce students to problem solving
- Model thinking
- Explaining how student solved
- Ways to talk through thinking
- Persevere through problems

**Focus on:** perseverance and mathematical conversations

- Go over each item that is discussed during week 2
- Ask for any clarification/questions - let teachers know visuals and more in-depth explanations are coming
- State that overall, this week focuses on ways to persevere and what it means, as well as more in-depth ways for students to communicate in mathematical ways
**Problem Solving**

Example of a problem solving template

<table>
<thead>
<tr>
<th>Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td></td>
</tr>
<tr>
<td>Visualize and summarize</td>
<td>Make a plan</td>
</tr>
<tr>
<td>Solve one way</td>
<td>Check another</td>
</tr>
<tr>
<td>Write an equation</td>
<td></td>
</tr>
<tr>
<td>Explain your thinking</td>
<td></td>
</tr>
</tbody>
</table>

- Go over some of the components on the planning template
- Address that during the second week, you can use mini lessons to talk about problem solving
- Anchor charts should be created and displayed to remind students of information and expectations
- Go over some of the components of solving word problems and how this fits into problem solving
- Address that during the second week, you can use mini lessons to talk about word problem solving
- Anchor charts should be created and displayed to remind students of information and expectations
MODELING THINKING

Create an example of different strategies to show how you solved

- Go over different ways (strategies) students can show their thinking (see poster)
- Address that during the second week, you can use mini lessons to talk solving strategies
- Anchor charts should be created and displayed to remind students of information and expectations
Solving talking points

Example of prompts to help encourage multiple ways to solve

- Go over different ways to encourage multiple solving strategies
- Address that during the second week, you can use mini lessons to talk solving strategies
- Anchor charts should be created and displayed to remind students of information and expectations
Talking through thinking

Example of prompts students can use to talk through their thinking like a mathematician

- Go over some of the prompts students can use when they start talking about solving
- Address that during the second week, you can use mini lessons to talk about talking and ways to start talking about your thinking
- Anchor charts should be created and displayed to remind students of information and expectations
PERSEVERANCE

- Talk to students about the importance of working through a problem
- “Stick with it”
- “Wrestle with a problem”
- Growth and fixed mindset

- Teaching students perseverance is one of the greatest gifts the teachers can teach students
- Talk about how students need to learn to stick with it or wrestle with a problem in order for their brains to grow and to truly understand a problem
- Growth mindset: students are willing to try their best, keep working through tough times, and to make mistakes
- Fixed mindset: students are stuck and give up easily. Often times will hear “I can’t do this!”
- Talk through some of the components of this anchor chart and how teachers can break down the information
  - spend one day on perseverance
  - spend one day one growth mindset
  - spend on day on fixed mindset
**Closing: Reflecting on Today’s Session**

- This WILL BE overwhelming and it’s OKAY!

- Today’s purpose/intent

- Moving forward: providing transitional information and support on implementing weeks 3 and 4 into the classroom

- Restate that new learning is always overwhelming and the intent is to broaden perspectives and deepen understanding - NOT to make teachers feel bad if they are using old methods to teach math
- Today’s purpose was to provide information on how to implement week’s 1 and 2 into your classrooms
- Going forward: these sessions will help all teachers make the transition from past methods to The Math Workshop model while providing support
Questions/wonderings for future sessions

- What questions, wonderings, comments, or concerns do you have about The Math Workshop model weeks 1 and 2 that can help shape our next session?

Before you go….

1. Write down on paper provided on your table spot (name is not required)

2. Fold - then put in the box by the door on your way out

A peak at next week’s session: implementing weeks 3 and 4 into your classroom

- Have paper set up at each table prior to the start for questions
- Have a box to put questions by the door prior to the start for the folded pieces of paper
- Explain that staff is free to go after they have completed their question(s)
- Meeting time: approximately 50 minutes (the given time allotted for PLC’s each week)
- Welcome all members of the group
- Address norms and meeting agreements (made at the first team PLC meeting of the year)
- Give outline of today’s session/what to expect
- Have paper set up at each table prior to the start for questions
- Have a box to put questions by the door prior to the start for the folded pieces of paper
Outline of today’s session

- Review from last week’s session
- Understand the why and purpose of today’s session
- Layout of implementation process
- Dive deep into implementing weeks 3-4 into your classrooms
- Closing/Reflection of today’s session
- Learn what questions you have prior to learning about implementing The Math Workshop model after the last two sessions

- Ensure the audience knows what they can expect to learn and gain from today’s session - what the implementation process looks like and diving deep into weeks 3-4
- Explain that there will be time at the end to hear questions from today’s session and to gather future questions to guide the next sessions content to meet the needs of the present teachers
Why are we here?

- To better understand how we, as educators, can better meet the learning needs of our students during math periods
- Review the overall outline of implementing The Math Workshop model in your classrooms
- Understand week’s 3-4 implementation
- Hear what questions you have and what you are interested in learning about regarding The Math Workshop model

- The Math Workshop model has significant, positive research to reinforce the need to implement it in classrooms.
- Today’s session will allow you to review at what’s to come for the weekly outline of implementation, as well as an in depth look and support at implementing weeks 3-4 into classrooms

- Pause: give 1-2 minutes of reflection/time to think for teachers to gather any questions they have about TODAY’S session before moving forward to ensure all goals are clear and purposeful
* there will be time at the end to gather questions regarding future sessions at the END of today’s session
SNAPSHOT OF LAST WEEK’S SESSION

- Last week we learned:

**Week 1: Beginning The Journey**
- introducing the workshop model, math community, whole group discussions, and working together respectfully

**Week 2: Learning to Persevere, Reason, and Talk Mathematics**
- introducing problem solving, modeling thinking, showing how problems are solved, ways to talk through thinking, fixed vs. growth mindset, and persevering through problems.

- Use info on slides to review last weeks learning - no need to go into depth, just lightly touch upon what was learned to get ideas fresh in audience’s minds
Overview of implementing the Math Workshop Model

Week 1: Beginning the Journey

Week 2: Learning to Persevere, Reason, and Talk Mathematics

Week 3:

Week 4:

- Explain that this is the broad overview of what each week’s implementation focuses on
- Today’s session just focuses on weeks 3-4
Week 3:

- Implementing what students already know into mathematical discussions
- Double checking skills
- Precision
- Modeling thinking
- Using tools to solve

Focus on: using current knowledge to explain and ultimately teach to those around

- Go over each item that is discussed during week 3
- Ask for any clarification/questions - let teachers know visuals and more in-depth explanations are coming
- State that overall, this week focuses on ways to persevere and what it means, as well as more in-depth ways for students to communicate in mathematical ways
WHAT DO YOU ALREADY KNOW?

- Teachers should explain the importance of using what students already know
- Spend time modeling thinking (use anchor charts from week 2)
- Use base knowledge to build off of new knowledge

- Discuss the importance of teaching students that they already have a foundations of mathematical skills
- Address that during the third week, teachers can review modeling thinking skills from week 2's anchor charts
- Anchor charts should be created and displayed to remind students of information and expectations
- The importance of double checking for accuracy
- How does double checking make us better mathematicians?
- It’s okay to get things wrong
- Math should match the problem
- Students should begin using precise language
- Math is a language and a learning time - it will be going on all year long

- Address the importance of double checking for accuracy - finding mistakes, finding questions that went unsolved, etc.
- Double checking can make students better mathematicians because they are learning from their own mistakes and fixing things as they go
- When double checking, students should be making sure that their math is matches the problem and the question
- BE SURE to teach to students the lesson of it’s okay to find mistakes and to get things wrong - this is how we learn (comes up often when teaching about double checking)
- Teach how math is a language that they will be using and learning all year long
MODELING THINKING

- drawings
- manipulatives
- acting out
- diagramming

- Discuss that students should understand that they can model their thinking through drawings, manipulatives, acting out, and diagramming
- Potentially make an anchor chart with examples of each of these ways
- This learning stems from week 2
Math tools

Ideas of what to place in student toolkits for easy access and use (k-2 & 3-5)

- Address some of the tools that can be found in primary and secondary toolkits
- Plan of action for classrooms/teachers that don’t have some of the tools or access to them - borrow next door/budget for new/check with other schools?
- Anchor charts should be created and displayed to remind students of information and expectations

<table>
<thead>
<tr>
<th>Primary Toolkits (K-2)</th>
<th>Upper Elementary Toolkits (Grades 3-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials:</strong></td>
<td><strong>Materials:</strong></td>
</tr>
<tr>
<td>Unifix Cubes</td>
<td>Unifix Cubes</td>
</tr>
<tr>
<td>Fraction Squares, Circles Bars</td>
<td>Fraction Squares, Circles Bars</td>
</tr>
<tr>
<td>Pattern Blocks</td>
<td>Pattern Blocks</td>
</tr>
<tr>
<td>Beers</td>
<td>Beers</td>
</tr>
<tr>
<td>Base-Ten Blocks</td>
<td>Base-Ten Blocks</td>
</tr>
<tr>
<td>1-inch Tiles</td>
<td>1-inch Tiles</td>
</tr>
<tr>
<td>Dice; Double Dice</td>
<td>Dice; Double Dice; Triple Dice</td>
</tr>
<tr>
<td>Triple Dice; Dotted Dice</td>
<td></td>
</tr>
<tr>
<td>Mini-Dominoes</td>
<td>Mini-Dominoes</td>
</tr>
<tr>
<td>Mini Flash Cards</td>
<td>Mini Flash Cards</td>
</tr>
<tr>
<td>Numerical Dice</td>
<td>Numerical Dice</td>
</tr>
<tr>
<td>2 Colored Counters</td>
<td>2 Colored Counters</td>
</tr>
<tr>
<td>Chess Bingo Chips</td>
<td>Chess Bingo Chips</td>
</tr>
<tr>
<td>Rulers</td>
<td>Rulers</td>
</tr>
<tr>
<td>Calculator</td>
<td>Calculator</td>
</tr>
<tr>
<td>Coins</td>
<td>Coins</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Templates:</strong></td>
<td><strong>Templates:</strong></td>
</tr>
<tr>
<td>Five Frame</td>
<td>Five Frame</td>
</tr>
<tr>
<td>Ten Frame</td>
<td>Ten Frame</td>
</tr>
<tr>
<td>Double Ten Frame</td>
<td>Double Ten Frame</td>
</tr>
<tr>
<td>100 charts</td>
<td>100 charts</td>
</tr>
<tr>
<td>120 chart</td>
<td>120 chart</td>
</tr>
<tr>
<td>200 chart</td>
<td>200 chart</td>
</tr>
<tr>
<td>Number Lines</td>
<td>Number Lines</td>
</tr>
<tr>
<td>Number Ladders</td>
<td>Number Ladders</td>
</tr>
<tr>
<td>Number Tracks</td>
<td>Number Tracks</td>
</tr>
<tr>
<td>Unifix Cubes Paper</td>
<td>Unifix Cubes Paper</td>
</tr>
<tr>
<td>Fraction Squares, Circles Bars</td>
<td>Fraction Squares, Circles Bars</td>
</tr>
<tr>
<td>Pattern Block Paper</td>
<td>Pattern Block Paper</td>
</tr>
<tr>
<td>Base-Ten Grid Paper</td>
<td>Base-Ten Grid Paper</td>
</tr>
<tr>
<td>Ten Thousand Grid Paper</td>
<td>Ten Thousand Grid Paper</td>
</tr>
<tr>
<td>Centimeter Paper</td>
<td>Centimeter Paper</td>
</tr>
<tr>
<td>Inch Grid Paper</td>
<td>Inch Grid Paper</td>
</tr>
<tr>
<td>Decimal Wheels</td>
<td>Decimal Wheels</td>
</tr>
<tr>
<td>Centimeter Paper</td>
<td>Centimeter Paper</td>
</tr>
</tbody>
</table>

Tools depend on the grade. These are general suggestions for the given grade bands.
Reason for tools

Example of anchor chart for understanding why tools are used during math time

<table>
<thead>
<tr>
<th>Rules for Tools!</th>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>We use tools to help us think!</td>
<td>We use many different tools, bears and counters, cubes</td>
</tr>
<tr>
<td>We keep our toolkits organized.</td>
<td>They're cool!</td>
</tr>
<tr>
<td>We use them when we need them.</td>
<td>We know how to use them well,</td>
</tr>
<tr>
<td>We put them up when we are done.</td>
<td>And clean up when we hear the bell!</td>
</tr>
<tr>
<td>We use our templates to sketch out answers.</td>
<td></td>
</tr>
</tbody>
</table>

- Address some of the rules for tools and why they are important
- Anchor charts should be created and displayed to remind students of information and expectations
Week 4:

- Implementing math workshop stations
- Math workshop station routines
- Working individually, with partners, and small groups
- Guided math groups
- Timing for guided math groups - when is the right time to start?

**Focus on:** math workshop stations and guided math groups

- Go over each item that is discussed during week 4
- Ask for any clarification/questions - let teachers know visuals and more in-depth explanations are coming
- State that overall, this week focuses on ways to persevere and what it means, as well as more in-depth ways for students to communicate in mathematical ways
WORKSTATIONS

Example of an anchor chart showing what math workshop should look, sound, and feel like

- Go over some of the ideas of what workstations should look like, sound like, and feel like
- These will be similar to the overall looks like, sounds like, and feels like created in week 1 for math workshop
- Anchor charts should be created and displayed to remind students of information and expectations
Workstation expectations

Example of an anchor chart showing some ideas for workstation expectations

- Talk through some of the workstation expectations and why it’s important to have these expectations
- Make sure teachers understand the purpose behind math workstations so they can then teach the importance to their students
- Anchor charts should be created and displayed to remind students of information and expectations
- Talk through some of the possibilities for creating a workstation schedule (besides just the given one)
- This is primarily a teacher’s choice - they need to find what kind of schedule works best for them
- Anchor charts should be created and displayed to remind students of information and expectations
GUIDED MATH

- Should not begin until students are showing independence
- This WILL vary class to class
- Match guided reading procedures (when to interrupt, etc.)
- Planning is based on data and performance

- Stress the importance of waiting to start guided math until students show independence during their workstation time
  - this means that students need little to no redirection to stay on task, be where they belong, and know their jobs with guidance
- The timing for beginning guided math groups will vary from class to class as each group of students require different needs and areas of support
- Many routines will be in place for this as students learn literacy routines for guided reading - reteach when it’s okay to interrupt, and other expectations
- Plan instruction based on student data from quizzes, tests, and daily work
- Work on support students in areas of needs through the guided math (small group time)
Types of Guided Math

There are a variety of types for guided math groups

- Talk through each of the types of guided math groups (concept, procedure, strategy, model, reasoning, and math talk)
- Choosing what type of guided math group will depend on the group of students that day, as well as the targeted area they need support in
- This is more of a reference for teachers - not to be used as an anchor chart
Closing: reflecting on today’s session

- This WILL continue to be overwhelming and that’s OKAY!

- Today’s purpose/intent

- Moving forward: providing transitional information and support on the timing of math workshop and overall implementation process

- Restate that new learning is always overwhelming and the intent is to broaden perspectives and deepen understanding - NOT to make teachers feel bad if they are using old methods to teach math

- Today’s purpose was to provide information on how to implement week’s 2 and 3 into your classrooms

- Going forward: these sessions will help all teachers make the transition from past methods to The Math Workshop model while providing support
Questions/wonderings for future sessions

- What questions, wonderings, comments, or concerns do you have about The Math Workshop model weeks 3 and 4 that can help shape our next session?

Before you go....

1. Write down on paper provided on your table spot (name is not required)

2. Fold - then put in the box by the door on your way out

A peak at our last session: looking at the time break outs for each component of math workshop

- Have paper set up at each table prior to the start for questions
- Have a box to put questions by the door prior to the start for the folded pieces of paper
- Explain that staff is free to go after they have completed their question(s)
Math Workshop Model:
Session four

Understanding the components of The Math Workshop model

- Meeting time: approximately 50 minutes (the given time alloted for PLC’s each week)
- Welcome all members of the group
- Address norms and meeting agreements (made at the first team PLC meeting of the year)
- Give outline of today’s session/what to expect
- Have paper set up at each table prior to the start for questions
- Have a box to put questions by the door prior to the start for the folded pieces of paper
Outline of today’s session

- Review from last week’s session
- Understand the *why* and *purpose* of today’s session
- Layout of components of the workshop
- Dive deep into each component
- Closing/Reflection of today’s session
- Learn what questions you still have for going forward

- Ensure the audience knows what they can expect to learn and gain from today’s session - what each component is and the purpose behind it
- Explain that there will be time at the end to hear questions from today’s session and to gather future questions going forward
Why are we here?

- To better understand how we, as educators, can better meet the learning needs of our students during math periods
- Review the overall outline of The Math Workshop components
- Understand each component individually
- Address any lingering questions

- The Math Workshop model has significant, positive research to reinforce the need to implement it in classrooms.
- Today's session will allow you to review at what's to come for the weekly outline of implementation, as well as an in depth look and support about each of the workshop components
- Pause: give 1-2 minutes of reflection/time to think for teachers to gather any questions they have about TODAY'S session before moving forward to ensure all goals are clear and purposeful
* there will be time at the end to gather questions regarding future sessions at the END of today's session
SNAPSHOT OF LAST WEEK’S SESSION

- Last week we learned:

  **Week 3: Showing What You Know and Double Checking It**
  - using what students already know, double checking, precision, modeling thinking, and using tools to solve

  **Week 4: Introducing Math Workstations and the Guided Math Groups**
  - implementing math workshop stations, math workshop station routines, working individually/with partners/small groups, guided math groups, and understanding the right time to start

- Use info on slides to review last week's learning - no need to go into depth, just lightly touch upon what was learned to get ideas fresh in audience’s minds
Math workshop components

- Opening
- Mini-lesson
- Math Workstations
- Guided Math Groups
- Sharing
THE OPENING

Possible openers include:

- Calendar (7-8 minutes)
  - Look at weather, collect data about themselves and others, and count things that impact their day (like attendance and lunch)
- Energizer (5 minutes maximum)
  - Ideas include: half it, number line it, true or false, which doesn’t belong, walking down the street, etc.
- Fluency routines
  - Number of the day/Fraction of the Day/Decimal of the Day
- Problem of the day (10 minute maximum)
  - Create a problem that might take a few days to explore and enrich children in this problem through solving strategies and thought provoking questions

- the opening is the foundation of The Math Workshop
- Calendar can be used as an opener to: get students to realize that it is a routine about their everyday lives
- Energizers help build: number sense, vocabulary, conceptual knowledge, modeling skills, procedural fluency, strategic competence, and mathematical disposition
- Fluency routines help build fluency through talk, discussion, and games
- Problem of the day allows students to engage deeply with rich tasks
THE MINI-LESSON

“Mini-lessons are portals into powerful thinking” - Newton, 2014

- Goals
  - mathematical proficiency, building conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and mathematical disposition

- Teacher’s role
  - facilitate the learning around the desired goal - talk about what the class is going to talk about and work as a coach during the discussion

- Student’s role
  - writing math, mental math, verbal math, or acting out their mathematical thoughts.

- Types of mini-lessons
  - conceptual, procedural, strategic, and mathematical disposition

- Goals of mini-lessons include: mathematical proficiency, building conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and mathematical disposition
- Teacher’s role: facilitate the learning around the desired goal - talk about what the class is going to talk about and work as a coach during the discussion
- Student’s role: writing math, mental math, verbal math, or acting out their mathematical thoughts.
  - student’s are an active part of the mini lesson and should be hands on learning
- Types of mini lessons include: conceptual, procedural, strategic, and mathematical disposition
CONCEPTUAL MINI-LESSONS

- teaching children about a concept
- working on big ideas and enduring understandings
- use prompting to guide discussion

Examples of conceptual mini lessons might include: using picture books, videos, and/or guided questions.
Procedural mini-lessons

- teaches students how to do the math
- can be used to teach about particular algorithms or strategies
- might be used to teach how to draw or illustrate a concept

Examples of procedural mini-lessons might include: drawing an open number line, talking about how students might use it, and then modeling how to use it.
Strategic competence mini-lessons

- teaches students how to use various strategies
- huge emphasis on using this type of mini-lesson and using flexible strategies in many states
- levels of strategies for addition, subtraction, multiplication, and division

Examples of strategic competence mini-lessons might include: making a list of strategies students can use for addition, subtraction, multiplication, and division and having in depth conversations covering how to use and when to use each strategy
Mathematical Deposition mini-lessons

- students talk about their learning trajectory
- talk about themselves as learners and what makes a good mathematician
- lessons might revolve around habits of mind and exhibiting ways to be a great mathematician

Examples of strategic competence mini-lessons might include: deep reflections, thinking about thinking, habits, and structured conversations
The Workstations

- help students practice what they have already been introduced to
- extend learning
- give instructional lessons purpose
- help students learn with hands on experiences
- allows for some “free choice” periods of the day
**The Workstations**

Examples of workstations include:

- math on my own (independent math)
- technology - chromebooks, iPads, etc.
- math games (working with partners or small groups)
- independent games
- math books

- refer back to the breakdown and scheduling from session three for examples
  *one station a day*
GUIDED MATH GROUPS

- small, intentional lessons
- revolves around a particular topic
- occur for 8-15 minutes
- gives an opportunity to talk with students and do math

- every student should work in a small guided math group sometime during each week
- guided math lessons can take place anywhere in the classroom - set aside a space so that it goes uninterrupted
- lessons should include a similar format of: introduction, student activity, debriefing, next steps
SHARING
- facilitates conversations about math based on what happened that day

- the purpose:
  - concretize the learning from the day
  - summarize the key points in the unit thus far
  - take a scan of the class to see where everybody is
  - possibly do some writing together and share mathematical discoveries

- components of sharing:
  - reflecting on I Can statements
  - shared thinking/interactive class journal
  - share chair

- sharing takes time to make purposeful
- the different components of sharing can be used at different times of the year - does not need to be all three every day
Overview of the Components

This shows how the time can be broken down daily for The Math Workshop model.
- This WILL continue to be overwhelming and that’s OKAY!

- Today’s purpose/intent

- Moving forward: contact with any questions/concerns/areas of needed support while beginning to implement the workshop model

- Restate that new learning is always overwhelming and the intent is to broaden perspectives and deepen understanding - NOT to make teachers feel bad if they are using old methods to teach math
- Today’s purpose was to provide information on each of the components that make up the workshop model
- Going forward: these sessions will help all teachers make the transition from past methods to The Math Workshop model while providing support
Wrap Up

Before you go…

Please complete the survey and leave on your table when complete

**Don't hesitate to reach out in the future with questions or areas you need support with!

THANK YOU!!

- Have paper set up at each table prior to the start for questions
- Have a box to put questions by the door prior to the start for the folded pieces of paper
- Explain that staff is free to go after they have completed their question(s)