The purpose of the First 10 Days is to establish math routines and expectations that will prepare students for the Common Core classroom. As students transition into CCSS, time is needed to establish these mathematical practices. This document includes classroom routines, expectations, and math tools that encourage the Standards for Mathematical Practice. It also provides lessons that allow students to develop number sense concepts within the structure of the CCSS Math Practices. Included in this document are the following:

- Fluency: Number Talks *(Days 2-10)*
- Three Phase Problem-Solving Structure: Daily Task from enVision MATH (Days 1-10)
- Non-Verbal Signals (Days 2-10)
- Listening and Speaking Expectations (Days 1-10)
- Talk Moves for Mathematical Discussions (Days 1-10)
- Expectations for Partner Games, Small Groups & Rotations and Independent Work Time

* In this document, the Three-Phase Problem-Solving structure and Number Talks develop the routine of classroom conversations. Authors/researchers, Fosnot and Dolk (2002), state that the purpose of the class conversation is to support and direct the development of mathematicians in the classroom learning community, rather than fixing mistakes in the children’s work. This conversation enables the teacher to focus the students on reasoning about a few big mathematical ideas derived from the mathematical thinking present in students’ solutions. It focuses whole class discussion on two or three, strategically selected, student solutions in order to develop every student’s mathematical learning.

The goals of the classroom conversations are to provide opportunities for students to (Smith, 2011):

- Share ideas and clarify misunderstandings
- Develop convincing arguments regarding why and how things work
- Develop a language for expressing mathematical ideas
- Learn to see things from other people’s perspective

“...the power of Number Talks comes from inspiring each child to think and make sense of the mathematics they are presented. They are never trying to figure out what the teacher wants. Rather they are totally engaged in their own sense making process...Number Talk is an opportunity for children to learn that they can figure things out for themselves in a way that makes sense to them... children can begin to apply what they are learning in lessons and try out ideas they may be pondering.”

Source: “What is the distinction between a Lesson and a Number Talk,” by Kathy Richardson
Establishing the Daily Math Routine

**Number Talk.** **Problem-Solving.** **Independent Work Time.** Establishing a daily math routine that is flexible and can be adapted to a wide range of tasks is essential for efficient mathematics teaching. It is important for students to understand each phase of the daily routine and expectations for work and behavior.

The daily math routine begins with a **Number Talk** to help students develop and discuss strategies to build computational fluency and number sense, leading to accuracy, efficiency and flexibility. Accuracy is the ability to produce an accurate answer. Efficiency is the ability to choose an appropriate, expedient strategy for a specific computation problem. And flexibility is the ability to use number relationships with ease in computation.

The three-phase **Problem Solving** structure (Before, During, and After, see Appendix) outlined in this document can serve two purposes: it can be utilized for both direct instruction and an inquiry lesson model. The three phase Problem Solving structure supports the introduction of a new skill/concept or clarifies and practices an emerging skill, through a rigorous math task. Teaching mathematics with problem-based tasks is student centered rather than teacher centered. It begins with and builds on the ideas that children have available. It is a process that requires faith in children, a belief that all children can create meaningful ideas about mathematics.

In the Before Phase, the teacher sets up the task with the whole group and makes sure that the students understand the problem or task. The teacher also sets up expectations, such as requiring students to explain their thinking in more than one way, rather than simply giving an answer. Behind the scenes, the teacher has solved the task in a variety of ways to anticipate student misconceptions, and has scripted questions to clarify, assess and advance learning.

The During Phase is independent/partner/small group work time to solve the task. As students complete the tasks they can use various resources and manipulatives of their choosing. Students will benefit from completing tasks that are open ended or where there is more than one solution path. It is important to allow students to use a variety of strategies to complete the task. The teacher may monitor group work by asking questions and actively listening to what students say as they reveal how they think, what they know, and how they are approaching the task.

In the After Phase, also called “Share, Discuss and Analyze,” students debrief their work and learning collaboratively. Student work samples are strategically shared and the teacher facilitates a discussion that ties student learning to the big mathematical ideas. The teacher asks students preplanned questions that require students to extend their understanding of the concept. A useful routine in this phase begins with the teacher displaying a student work sample on the document reader while inviting the class to make sense of the work displayed. Students are provided a minute of private think time and then an additional two minutes to discuss with an elbow partner. The teacher may ask students to explain the strategies they believe the student used to solve the problem. The teacher may display a second sample.
and ask students to think about how this work sample is the same, yet different from the prior sample. Again one minute of private think time is provided followed by an additional 2 minutes of partner or small group talk. This routine addresses Math Practice Standard 3, “Construct viable arguments and critique the reasoning of others.”

Also important is the need to address misconceptions and errors that students may have about a skill or concept. The teacher may choose to display a work sample with a misconception or error without commenting on the validity of the response. Establishing a safe environment where all students learn from each other’s mistakes is a key component. Students are asked to examine the work sample. Students think individually and then discuss with a partner. As they ask questions of each other, misconceptions or errors are surfaced. Wrong answers can be very useful as students make their own determinations of what is incorrect, and collectively determine how to correct the work.

It is often difficult for students to put their thoughts into words, because this requires metacognition and vocabulary development. Understanding and communicating HOW a problem was solved is often challenging but enormously worthwhile. The use of multiple representations helps students communicate their thinking visually (MP4), quantitatively (MP2) and with precision (MP6). It is also helps incorporate various learning styles into the daily math routine.

On the first day this routine is discussed, outlined and charted for the students in a whole group discussion.

<table>
<thead>
<tr>
<th>Before: Set Up</th>
<th>During: Explore</th>
<th>After: Share, Discuss and Analyze</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole group</td>
<td>Students work individually, with partners or with small groups</td>
<td>Whole group</td>
</tr>
<tr>
<td>Teacher led (rigorous task selected, misconceptions noted, questions written)</td>
<td>Teacher works with small groups or facilitates a task</td>
<td>Student led / Teacher facilitated Teacher strategically selects 3-4 solutions to be shared</td>
</tr>
<tr>
<td>Pose a question to explore a new concept or practice a skill</td>
<td>Students work on a math task or problem</td>
<td>Students and teacher ask questions to make sense of other’s work</td>
</tr>
<tr>
<td>Requires problem-solving</td>
<td></td>
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</tr>
</tbody>
</table>
Individual Work Time is the third component of the daily math routine, providing opportunity for students to practice their emerging math skills while the teacher differentiates instruction in small groups. Establishing independent and group work norms is a critical component of a successful Independent Work Time. Different factors will contribute to how well a class can work together in groups. It can be beneficial to assign each group member a specific role (materials getter, recorder, parliamentarian, etc.). Assigning roles helps to hold all students accountable. Groups should be flexible and reorganized regularly in an effort to meet the changing needs of students as they develop.

Using the First 10 Days to establish these routines will create a Common Core Classroom to last all year long. The following is a day-by-day guide.
**Day 1 Objectives:** Set the stage for problem-solving, including introducing: problem-solving notebook, listening and speaking expectations, a math talk move, and the Share, Discuss and Analyze phase.

**Introduce Problem-Solving:**
- Present a problem to students: for example: enVision MATH 1-1 Interactive Problem-Based Learning or Quick Check. Writing to Explain: Suppose you pick three number cards, 5, 7, 8. You use the cards to make the greatest 3-digit number. What number is it? Give an explanation of how you found your answer.
- Allow the children to discuss
- Say: “Let’s think about what we have to do to solve this problem. Let’s share out.”

Together as a classroom, create a Problem-Solving Chart before distributing the problem-solving notebook and manipulatives. Discuss and write expectations and behaviors for problem-solving on the chart (here are some possible suggestions):
- Have a positive attitude (I can do this!)
- Keep trying and don’t give up!
- Use good problem-solving strategies
- Work together, but do your own thinking
- Explain your thinking
- Safe environment (what does that look like, sound like, feel like?)

**Introduce Problem-Solving Notebook:**
- Give each student a problem-solving notebook.
- Have manipulatives readily available to use for counting (number lines, base ten blocks, snap cubes, pattern blocks, color tiles, etc.) For classroom management purposes you may want manipulatives in bins in an assigned area of your classroom. Discuss appropriate manipulatives use with your students.
- Decide how to record the problem in the problem-solving notebook before solving it. Ideas include: copying the question on mailing stickers that can be peeled off and placed in the notebook, copying the question on half-sheets and gluing, students write question. Allow students time to draw and write their responses to the math problem in their problem-solving notebook.
- Students will share their responses in Share, Discuss and Analyze (see next page.)

To establish expectations for behaviors in a problem solving math classroom

**Materials:**
- Chart paper
- Markers

To establish appropriate manipulatives use and to allow students to strategically choose them for problem solving

**Materials:**
- Problem Solving Notebook
  **(Option: “Problem-Solving Recording Sheet” from enVision)**
- Manipulatives
**Introduce the Speaking and Listening Expectations:**

- Talk with the students about the actions of a good listener. Say: “What does a good listener do?” (A good listener listens with the intent to understand. They look at the person talking and visualize or picture in their head what the speaker said.)

**Talk Moves for Teacher Background Only:**

In order to orchestrate productive discussions in the classroom, teachers need a set of moves that will help them lead whole-class discussions in which students share their thinking with one another in respectful and academically productive ways. Although there are many moves that teachers can use to lead productive classroom discussions, this document will only focus on five: (1) **revoicing** (2) asking students to restate someone else’s reasoning, (3) asking students to apply their own reasoning to someone else’s reasoning, (4) prompting students for further participation, and (5) using wait time.

**Talk Move #1: Revoicing**

Model revoicing (Teacher repeats all or part of exactly what a student has said, as students share; the teacher can also prompt a student to revoice.)

- “What I heard you say was…."
- “You’re saying….”

**Share, Discuss and Analyze Teacher Background Only**

Classroom conversations support learning from each other. Students share their strategies, and listen to the strategies of others. They reinforce their own skills by explaining how they solved a problem and they learn new ways of problem solving by listening to other students explain their thinking. They can safely work through mistakes and misconceptions by talking with their peers. At the beginning of the year, this sharing may take place in a big circle or with students at their seats and one student sharing at the document camera just so everyone can see each other and their student work. The idea is to build a community of learners, where the thoughts of students are shared and honored. In Kindergarten through grade 2, this is called “Mathematician’s Turn” in the First 10 Days of School. The teacher will lead the sharing by strategically picking the work to be shared.

**Introduce the Share, Discuss and Analyze Phase:**

The purpose of the Share, Discuss and Analyze Phase is to provide a public forum where students will share, discuss, and provide feedback to one another. Students will share their solutions from the problem. Strategically select 3-4 student samples with different solutions (i.e. a drawing, an equation, or using manipulatives). Have students share their solutions one at a time while the other students listen, or anonymously share.
Grade 3-5: The First 10 Days
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Day 2 Objectives: To introduce Number Talks and non-verbal signals, continue setting up listening and speaking expectations, problem-solving and the Share, Discuss and Analyze phase.

<table>
<thead>
<tr>
<th>Number Talks-for Teacher Background only:</th>
<th>A number talk is a powerful tool for helping students develop computational fluency and number sense because the expectation is that they will use number relationships and the structures of numbers to add, subtract, multiply, and divide.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Number Talk is a short, ongoing daily routine that provides students with meaningful practice with computation. Classroom conversations and discussions around purposefully crafted computation problems are at the very core of number talks. These are opportunities for the class to come together to share their mathematical thinking and develop efficient, flexible, and accurate computation strategies that build upon the key foundational ideas of mathematics such as composition and decomposition of numbers, our base ten system, and the application of properties of operations.</td>
<td>Number Talks allow students to make connections and find relationships and patterns.</td>
</tr>
</tbody>
</table>

**Introduce Number Talks:**

Tell the students that we are going to be doing a Number Talk. They are to be thinking in their heads, and trying to figure out the answer to a problem. Tell them that they should be ready to share how they figured out the number. All number talks follow a basic six-step format.

1. **Teacher presents the problem:** Problems are presented in many different ways: a word problem, number lines, dot cards, models. You can show problems on a document camera or write on the board. Present today’s problems on the board: Insert problems, see Appendix for examples
2. **Students figure out the answer.** Give time to figure out the answer. To make sure the students have the time they need, ask them to give a “thumbs-up in front of chest” when they have determined their answer.
3. **Students share their answers. Teacher:** “At the count of three, whisper your answer.” Or some students share individually with the teacher recording the answers without judgment.
4. **Students share their thinking.** Have students think-pair-share before they share out their thinking. Have three or four students explain their thinking to the class.
5. **The class agrees on the “real” answer for the problem.** The answer that the class Together determined is the right answer is presented as one would the results of an experiment. The answer a student comes up with initially is considered a conjecture. Models and explanations may help students see where their thinking went wrong, identify a step they left out, or clarify a point of confusion.
6. **The steps are repeated for additional problems.** Thank the students for their participation in the Number Talk.

The conversation is the focus of the Number Talks, and the teacher takes on the role of facilitator. The teacher is not the ultimate authority in Number Talks. Students are clarifying their thinking with each other. Mental computation is a key component of number talks, encouraging students to build on number relationships to solve problems instead of only relying on memorized procedures.
Day 2

**Introduce Non-Verbal Signals:**
Establish non-verbal signals that will support productive math discussions. These signals also support effective classroom management. Teach students the following signals:

- **Agree:** Thumbs up held away from body
- **Disagree:** "Safe" sign in baseball: palms flat and down, in a crossing motion in front of the chest
- **I don’t know:** hand over head, palm flat and facing floor, moves back and forth
- **Thinking:** fist in front of chest
- **I have an answer:** thumbs up in front of chest
- **I have another way of getting the answer:** finger up in front of chest (can show additional finger for each way)

**Listening and Speaking Expectations:**
Make a poster (chart paper) of a Good Listener and Not a Good Listener. Use student suggestions.

**Problem Solving:**
- Review the behaviors/expectations from the Problem-Solving Chart (from Day 1.)
- Present and discuss today’s math problem, selected from enVision MATH 1-2
- Allow children time to draw and write their responses to the problem in their problem-solving notebook.
- The focus should be on “How can you show your answer?”
- Have manipulatives available and encourage students to use them to solve the problem.
- (Students can share during Share, Discuss and Analyze.)

**Share, Discuss and Analyze Phase:**
- During Share, Discuss and Analyze, ask the students how they found their answer. It’s important to point out the variety of solutions, especially students that used multiple methods.
- Ask students which manipulatives they used and how they used them to solve the problem.
- Model Talk Move #1: Revoicing

**Materials:**
- Chart Paper
- Markers
- Problem-Solving Chart
- Problem Solving Notebook

**To set expectations for classroom management during mathematics discussions**

**To set expectations for shared thinking when engaged in academic conversations around mathematics**

**To encourage students to learn to share and discuss during math**

**To continue to set expectations for writing in the problem solving math notebook**
Day 3 Objectives: Review non-verbal signals, listening and speaking expectations, and do a Number Talk. Introduce a new talk move, continue with daily problem-solving, practice sharing solutions and introduce partner math games.

### Review Non-Verbal Signals: (see Day 2)

**Listening and Speaking Expectations:**
Review the Good Listener and Not a Good Listener poster from Day 2.

**Number Talk:** *(Model Talk Move #1, Revoicing, & Non-verbal Signals)*
Follow the same 6 steps as outlined in Day 2 (Math Talks).

*Insert Problem*

**Teacher:** Think about how to solve this problem. Put your fist on your chest like this (show). When you have one way of getting the answer, put up your thumb, like this (model). When you have a second way of getting the answer, put up a finger, like this (model). I’ll ask you to tell me the answer when most people are ready. Now I’m giving you think time.

Based on the problem, a variety of strategies might be used, including:
- Adding by place value
- Incremental adding (by tens and ones)
- Composing and decomposing (making a “friendly” number)

### Introduce Talk Move #2: Restating

Model asking students to restate someone else’s reasoning. Instead of revoicing a student’s idea in the exact same words, you can ask another student to restate in his or her own words, what the first student has just said.

### Problem-Solving:

Review Problem-Solving Chart for behaviors/expectations. Present and discuss today’s math problem, selected from enVision MATH 1-3:

*Insert Problem*

- Allow students time to draw and write their responses to the problem in their problem-solving notebook.
- The focus should be on “How can you show your answer?”
- Have manipulatives available and encourage students to use them to solve the problem.

This is an open-ended problem with multiple solutions. Ask students to show different ways to solve the problem. Students might use visual representations, equations, models, etc. (Students share responses during Share, Discuss and Analyze.)

Materials:
*Listener/Not a Good Listener poster*

To continue to understand the concept and encourage the use of Number Talks

Number Talks can take many forms. During a Number Talk, the teacher writes a problem on the board, horizontally, and gives the students time to solve the problem mentally. The focus is “How did you get your answer?”

Restating: A student’s restating of another student’s contribution marks the contribution as being especially important and worth emphasizing. It signals to the author that his or her idea is being taken seriously.

To continue drawing and writing about math using precise vocabulary and establish shared expectations for math problem-solving notebooks
### Share, Discuss and Analyze: (Model Talk Move #2, Restating, & Non-Verbal Signals)
- During Share, Discuss and Analyze, ask the students how they found their answer to the problem. Encourage them to explain their thinking process and reasoning. Ask several students to share their solutions. Remember to strategically select a variety of problem solving methods.

### Introduce a Partner Math Game:
Show how to play a math game and model appropriate vs. inappropriate use of the math tools involved. Begin a class chart titled “Independent Work Time (IWT) Expectations” to record responsibilities and expectations for partner math games and work time.
- What will the games look like?
- What will the game sound like?
- Where will the games take place?
- What will be the role of each partner during the game?
- What are the expectations for clean up?

Possible math games:
- EnVision center games
- Exploration with manipulatives
- Additional resources materials from the Curriculum Map

After game is played for about 5 minutes, stop and facilitate a class self-assessment of expectations. What went well? What do we need to work on? What were the tools used during the game? What tools were appropriate to use and/or not appropriate to use? Game play should continue after self-assessment in order for pairs to work toward meeting classroom expectations.

### Materials:
- Problem-Solving Chart
- Problem-Solving Notebook
- Manipulatives

Mistakes play a part in developing math thinking, as they call for questioning and discussion. Help the students realize that mistakes are important for our learning, and celebrate the opportunities!

To begin to establish expectations for independent games and activities

### Materials:
- Math Games
- Manipulatives
- Chart Paper

Possible norms for charting:
- Be Your Own Problem-Solver
- Ask 3 Before Me
- Use a 6-inch Voice
- Take Turns
- Clean Up
- Make Wise Choices
### Day 4 Objectives
To review non-verbal signals, listening and speaking expectations, practice a Number Talk, introduce a new talk move, continue with daily problem solving and sharing solutions and a new partner math game.

### Day 4

#### Number Talk: (Model Talk Move #2, Restating, & Non-Verbal Signals)
Follow the same 6 steps as outlined in Day 2 (Number Talk). Introduce today’s problems on board:

<table>
<thead>
<tr>
<th>Insert problem</th>
</tr>
</thead>
</table>

Based on the problem, a variety of strategies may include:
- Adding up (from smaller number to larger number
- Incremental subtracting
- Subtracting by place value, tens/ones:

Remind the students that they should be ready to share their strategies with the class. Model Non-Verbal Signals. Give think time.

When most students indicate that they are ready through their hand signal, then call on four or five students to share their sum. Teacher neutrally records responses on the board.

Ask for students to share their strategies and justifications with the class. Encourage the class to use hand signals to agree/disagree, and explain why. Thank the children for participating.

#### Problem-Solving: (Model Talk Move #2, Restating, & Non-Verbal Signals)
Tell the students: “Today we are going to introduce a tool to help us with problem-solving. It’s called a bar diagram. This is a tool we can use throughout the school year. One of our jobs as mathematicians is to build a toolbox of tools, or strategies, that we can use to help ourselves. When we share our tools or strategies that we use for problem-solving, we help each other understand math. And that’s one of the most important things about math, that it makes sense! And that it’s fun!”

Bar diagrams help students understand relationships between the quantities in the problem, and this helps students choose a correct operation to solve the problem. You can find more information on Bar Diagrams in the Program Overview of enVision MATH.

- Present and discuss today’s math problem:
  | Insert Problem that can be represented with a bar diagram |
- Ask the students, “How might we use this bar diagram to help us solve this problem?”
- Discuss strategies and then have the students solve the problem in their problem-solving notebooks. (Students discuss solutions during Share, Discuss and Analyze.)

To continue to understand the concept and encourage the use of Number Talks

To establish the concept of a tool box for problem-solving throughout the year

Difficulty getting started?
Ask questions: What is the problem asking us to find out? What do you know? Without giving away the answer, how are you thinking about solving the problem?

**Materials:**
* Problem-Solving Notebook
* Bar Diagram (Part/Part Whole Mat can be found in enVision—Teaching Tools)
### Day 4

**Review Listening and Speaking Expectations**

**Share, Discuss and Analyze:** *(Model Talk Move #2, Restating, & Non-Verbal Signals)*

During Share, Discuss and Analyze, ask the students how they found their answer to the problem. Encourage them to explain their thinking process and reasoning. Ask several students to share their solutions. Reminder to strategically select a variety of problem solving methods.

**Practice New Partner Math Game:**

Revisit the math game from Day 3. Remind students about the game procedures and expectations. Review “IWT Expectations Chart” on expectations for partner math games.

- Debrief “what is going well” vs. “what needs to be better” in relation to math games expectations. What were the tools used during the game? What tools were appropriate to use and/or not appropriate to use?

Add to the IWT Chart:

**Independent Work Time Expectations**

- Do not take the work to your teacher
- Do not interrupt the teacher if she is working with a small group

Explain to the class that during work time the teacher may be doing several different things: listening to the different groups discuss their math thinking, asking questions to prompt further work or explanation, meeting with small groups on a specific skill, or meeting with individual students.

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To establish expectations for independent games and activities

**Materials:**

- IWT Expectations Chart
- enVision MATH games
<table>
<thead>
<tr>
<th><strong>Day 5 Objectives:</strong> Review non-verbal signals, listening and speaking expectations, introduce a talk move, continue problem-solving and sharing solutions, and introduce small groups and independent work time.</th>
</tr>
</thead>
</table>

### Day 5

<table>
<thead>
<tr>
<th><strong>Review Non-Verbal Signals:</strong> (see Day 2)</th>
</tr>
</thead>
</table>

#### Review Listening and Speaking Expectations

#### Introduce Talk Move #3: Applying own reasoning...
Introduce the Math Talk move of “applying reasoning to someone else’s reasoning.” Ask a child if they agree or disagree with someone and why. You can also encourage students to add on to what someone else has just said.

Reminder to praise student math talk and applaud volunteers. (Model this talk move during Share, Discuss and Analyze and Number Talk.)

#### Number Talk: (Model Talk Move #3, Applying own reasoning, and use Non-Verbal Signals)
Follow the same 6 steps as outlined in Day 2 (Number Talk).

Introduce today’s problems:
- Insert problems

#### Problem-Solving:
Present and discuss today’s math problem.
- Insert Problem, enVision 1-5, or a task with a bar model

Tell students that they will once again practice using a tool from their toolbox of tools/strategies for math. They will use a bar diagram. Draw a bar diagram on the board and ask students to problem solve using the bar diagram. (Students can discuss solutions during Share, Discuss and Analyze.)

#### Share Discuss and Analyze: (Model Talk Move #3, Applying own reasoning and use Non-Verbal Signals)
- During Share Discuss and Analyze, ask the students how they found their answer to the problem. Encourage them to explain their thinking process and reasoning. Ask several students to share their solutions. Reminder to strategically select a variety of problem solving methods.

This Talk Move gives another student the opportunity to restate, in his/her own words, what the first student just said.

A student’s restating of another student’s contribution marks the contribution as being especially important and worth emphasizing.

To continue to encourage the use of Number Talk

Continue to establish the concept of a tool box for problem-solving throughout the year.

**Materials:**
- Problem-Solving Notebook
Introduce Small Group and Independent Work Time:

*(It’s important to set up expectations for small group rotations and independent work time. There will be times when the teacher will need to work with a small group of students to meet their needs. It’s important that the other students know how to work independently and in small groups. They will also need to know how to rotate from location to location or activity to activity.)*

Break the class into 3-4 heterogenous groups. Assign groups to their own location within the classroom. Provide instructions on behavior expectations, rotation procedures, and clean up signal. Give each group a bin with one type of manipulative and allow groups to explore the items for 5 minutes. At the end of the time, signal for clean up time. Have students rotate to each station so that each group will have an opportunity to explore each type of manipulative.

Establish clear expectations for small group activity rotations:

- When will we rotate and what is the signal?
- How do I know what to do first, then next?
- Where will activities be located and who will get them?
- What is the expectation for clean up between activities?

To establish expectations for small groups and independent work time

Materials:

* Bins
* Manipulatives
* enVision Math Games
* IWT Expectation Chart
<table>
<thead>
<tr>
<th>Day 6 Objectives: Review non-verbal signals (optional), review speaking and listening expectations (optional), continue a Number Talk, problem-solving and sharing solutions, and establishing small group rotation and independent work time expectations.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Review Non-Verbal Signals: (see Day 2, optional)</strong></td>
</tr>
<tr>
<td><strong>Review Listening and Speaking Expectations (optional)</strong></td>
</tr>
<tr>
<td><strong>Number Talk:</strong> (Model Talk Move #3, Applying own reasoning, and use Non-Verbal Signals) Follow the same 6 steps as outlined in Day 2 (Number Talk). Introduce today’s problem on the board:</td>
</tr>
<tr>
<td>Insert Problem</td>
</tr>
<tr>
<td>Ask students to make sense of student strategies. (For example, ask, “Why did Jose take away ten instead of nine? Why did he add one at the end?”) Encourage students to explain other students’ strategies, for example, ask, “Why did Jenny break the number apart? Why did she select those numbers?” If there are a limited number of participants, after a quiet think time suggest, “Turn to one other person and share your answer and how you thought about it.”) Then prompt, “Let’s list our solution strategies. Who thought the same way/differently? Who has the same answer, but a different way to explain it?”</td>
</tr>
<tr>
<td><strong>Problem-Solving:</strong> Revisit the Problem-Solving Chart to review expectations for problem-solving. Present and discuss today’s math problem. Insert Problem Discuss strategies and then have the students solve the problem in their problem-solving notebook. (Students can discuss solutions during Share, Discuss and Analyze.)</td>
</tr>
<tr>
<td>Materials:</td>
</tr>
<tr>
<td>*Bins</td>
</tr>
<tr>
<td>*Manipulatives</td>
</tr>
<tr>
<td>Continue to establish the concept of a tool box for problem-solving throughout the year</td>
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</tbody>
</table>
### Grade 3-5: The First 10 Days
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| Day 6 | Share, Discuss and Analyze: *(Model Talk Move #3, Applying own reasoning, and use Non-Verbal Signals)*  
Share some of the entries in their problem-solving notebooks, celebrate efforts and establish pride in written work. Allow students to practice Talk Moves #1, Revoicing, #2, Restating, and #3, Applying own reasoning. | To express their opinions, critique the reasoning of others, agree/disagree, etc.  
**Materials:**  
*Problem-solving chart  
*Problem-solving notebook |  
**Continue with Small Group and Independent Work Time:**  
Extend the time at each station (5-10 minutes). While all other groups will continue with the manipulative exploration, one group will play the partner game previously introduced. Continue to monitor and set expectations for stopping, cleaning up, and rotating. Select a team captain responsible for bringing the bins to and from the designated area. Continue to praise those groups following agreed upon procedures. |  
To continue to establish expectations for small groups and independent work time  
**Materials:**  
*enVision MATH games  
*IWT Chart* |
### Day 7 Objectives:
Review listening and speaking expectations/non verbal signals (optional), introduce a talk move, continue Number Talks, problem-solving and sharing solutions, and introduce a new partner game or small group activity.

<table>
<thead>
<tr>
<th>Review Non-Verbal Signals: (see Day 2, optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review Listening and Speaking Expectations (optional)</td>
</tr>
<tr>
<td><strong>Introduce Talk Move #4: Prompting students for further participation</strong></td>
</tr>
<tr>
<td>After students have shared some initial ideas, more students can be asked to join in—prompt students for further participation. Examples:</td>
</tr>
<tr>
<td>• “Does anyone have any other thoughts or comments on what we’ve been talking about?”</td>
</tr>
<tr>
<td>• “Does anyone want to add to that?”</td>
</tr>
<tr>
<td><strong>Number Talk:</strong> (Model Talk Move #4, Prompting students for further participation, and use Non-Verbal Signals)</td>
</tr>
<tr>
<td>Follow the same 6 steps as outlined in Day 2 (Number Talk).</td>
</tr>
<tr>
<td>Introduce today's problems:</td>
</tr>
<tr>
<td>Insert Problem</td>
</tr>
<tr>
<td>Have students share their solutions.</td>
</tr>
<tr>
<td><strong>Problem Solving Notebook:</strong></td>
</tr>
<tr>
<td>Present and discuss today’s math problem:</td>
</tr>
<tr>
<td>Insert Problem</td>
</tr>
<tr>
<td>Discuss strategies and then have the students solve the problem in their problem-solving notebook. (Students can share solutions during Share, Discuss and Analyze.)</td>
</tr>
<tr>
<td><strong>Share, Discuss and Analyze:</strong> (Model Talk Move #4, Prompting students for further participation, and use Non-Verbal Signals)</td>
</tr>
<tr>
<td>Share some of the entries in their problem-solving notebooks, celebrate efforts, and establish pride in written work. Encourage them to explain their thinking process and reasoning. Allow students to practice Talk Moves #1, Revoicing, #2, Restating, #3, Applying own reasoning, and #4, Prompting students for further participation.</td>
</tr>
<tr>
<td>To continue building independence and appropriate communication with partners</td>
</tr>
<tr>
<td>Prompting a wider range of students to weigh in adds more ideas to the discussion</td>
</tr>
<tr>
<td>To practice drawing and writing about math</td>
</tr>
<tr>
<td>To express their opinions, critique the reasoning of others, agree/disagree, etc.</td>
</tr>
<tr>
<td><strong>Materials:</strong></td>
</tr>
<tr>
<td><em>Problem-solving notebook</em></td>
</tr>
</tbody>
</table>
**Grade 3-5: The First 10 Days**  
Launching Mathematics in the Common Core Classroom

<table>
<thead>
<tr>
<th>Day 7</th>
</tr>
</thead>
</table>
| **Introduce New Partner Game or Small Group Activity:**
As a whole group, revisit “IWT Expectations Chart” for expectations. Introduce a new game and review the game rules. Model the new game/activity and have all the students play. Inform students that the new game will be added to the group rotation. Break the class into groups and have the students play today’s games plus the previously taught games/activities. Have them play 5-10 minutes and then rotate to a different game/activity.

   Game ideas can come from the enVision materials, the additional resources in the curriculum maps, and from your own bank of materials.

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>To continue building independence and appropriate communication with partners</td>
</tr>
</tbody>
</table>

Los Angeles Unified  ●  Grades 3-5: First 10 Days of School  ●  Adapted from Carroll County, MD
Day 8 Objectives: To continue Number Talks, problem-solving, practicing talk moves, establishing small group rotation/independent work time expectations.

Day 8

<table>
<thead>
<tr>
<th>Review Non-Verbal Signals: (see Day 2, optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review Listening and Speaking Expectations (optional)</td>
</tr>
<tr>
<td><strong>Number Talk:</strong> (Model Talk Move #4, Prompting for participation, and use Non-Verbal Signals)</td>
</tr>
<tr>
<td>Introduce today’s problem:</td>
</tr>
<tr>
<td>Insert Problem</td>
</tr>
<tr>
<td>Have students discuss their strategies and solutions.</td>
</tr>
<tr>
<td>Review Listening and Speaking Expectations (optional)</td>
</tr>
<tr>
<td>Review Non-Verbal Signals: (optional)</td>
</tr>
<tr>
<td><strong>Problem-Solving:</strong></td>
</tr>
<tr>
<td>Revisit the Problem-Solving Chart to review expectations for problem-solving.</td>
</tr>
<tr>
<td>Present and discuss today’s math problem:</td>
</tr>
<tr>
<td>Insert problem</td>
</tr>
<tr>
<td>• Allow students to discuss how they might solve the math problem.</td>
</tr>
<tr>
<td>• If “Turn and Talk” or “Think-Pair-Share” is used, ask students what it looks like and model the procedures if necessary.</td>
</tr>
<tr>
<td>• Have students solve the problem in their problem-solving notebook.</td>
</tr>
<tr>
<td>• Have manipulatives readily available for students to use.</td>
</tr>
<tr>
<td>• Students can share solutions during Share, Discuss and Analyze.</td>
</tr>
</tbody>
</table>

A student who is unconvinced of an answer should be encouraged to keep thinking, and keep trying to understand. If it doesn’t make sense yet, keep thinking!

Materials:
* Math Game/Activity
* Problem-solving Chart
* Manipulatives
## Grade 3-5: The First 10 Days
### Launching Mathematics in the Common Core Classroom

<table>
<thead>
<tr>
<th>Day 8</th>
<th>Share, Discuss and Analyze: (Model Talk Move #4, Prompting for participation, and use Non-Verbal Signals)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Select a few students to share their solutions to the problem.</td>
</tr>
<tr>
<td></td>
<td>- Sharing student is prompted to ask the class if there are questions or comments.</td>
</tr>
<tr>
<td></td>
<td>- Encourage them to explain their thinking process and reasoning.</td>
</tr>
<tr>
<td></td>
<td>- Allow students to practice Talk Moves #1, Revoicing, #2, Restating, #3, Applying own reasoning, and #4, Prompting for participation.</td>
</tr>
</tbody>
</table>

### Introduce New Partner Game or Small Group Activity:

As a whole group, revisit the “IWT Expectations Chart” to review expectations. Introduce a new game and review the games rules. Model the new game/activity and have all the students play. Inform students that the new game will be added to the group rotation. Break the class into groups and have the students play today’s games plus the previously taught games/activities. Have them play 5-10 minutes and then rotate to a different game/activity.

### To set expectations for shared thinking and to respond to classmates in a reasonable manner

#### Materials:
- * Problem Solving Notebook
- * Hundred Chart (available in enVision Math—Teaching Tool 13)

### To continue to establish expectations for small groups and independent work time

#### Materials:
- * Math game/activity
- * IWT chart
- * Manipulatives
<table>
<thead>
<tr>
<th><strong>Day 9 Objectives:</strong> Introduce a new Talk Move, continue Number Talks, problem-solving and solution sharing, introduce a new partner game or small group activity.</th>
</tr>
</thead>
</table>
| **Introduce Talk Move #5: Wait Time**  
Give students time to compose their responses. A teacher may tap his/her leg for ten seconds between posing a problem, and calling on a student to respond. Or point your finger at your temple, showing that you’re thinking and hold it for ten seconds.  
**Number Talk:** (Model Talk Move #5, Wait time, and use Non-Verbal Signals)  
Follow the same 6 steps as outlined in Day 2 (Number Talk).  
**Insert Problem**  
Debrief the Number Talk.  
**Problem Solving:**  
Present and discuss today’s math problem. Have students model a real-life mathematical situation with an equation. Students can use manipulatives and/or math drawings to explain the equation.  
**Insert problem**  
Have students share their real-life mathematical situation with a partner. Students can then write their equation and solution in their problem-solving notebook.  
**Share, Discuss and Analyze:** (Model Talk Move #5, Wait time, and use Non-Verbal Signals)  
- Have students share their responses to the problem.  
- Ask students how they solved the problem.  
- Share explanation, thinking process and reasoning.  
- Allow students to practice Talk Moves  
**Introduce New Partner Game or Small Group Activity:**  
As a whole group, revisit the "IWT Expectations Chart" to review expectations. Introduce a new game and review the game rules. Model the new game/activity and have all the students play. The new game will be added to the group rotation. Break the class into groups, have the students play today’s games plus the previously taught games/activities. Have them play 5-10 minutes and then rotate.  
Wait time signals the value of deliberative thinking, recognizes that deep thinking takes time, and creates a normative environment that respects and rewards both taking time to respond oneself and being patient as others take the time to formulate their thoughts.  
More students are able and willing to join in if time is provided for them to create something that they feel comfortable about sharing.  
**Materials:**  
* Problem-Solving Notebook  
* Manipulatives  
* enVision Math Games  
When the class is ready, the teacher begins working directly with small groups of students, pre-teaching, reteaching, and remediating.  

Los Angeles Unified  
Grades 3-5: First 10 Days of School  
Adapted from Carroll County, MD
## Day 10 Objectives

To continue establishing expectations for the Common Core Math Classroom.

### Day 10

#### Number Talk: (Model Talk Move #5, Wait time, and use Non-Verbal Signals)
Follow the same 6 steps as outlined in Day 2 (Number Talk). Introduce problems.

*Insert problem*

#### Problem-Solving:
Revisit the Problem-Solving Chart to review expectations for problem-solving. Present and discuss today’s math problem.

*Insert problem*

Discuss strategies and then have the students solve the problem in their problem-solving notebook. (Have students share their solutions during “Share, Discuss and Analyze.”)

#### Share, Discuss and Analyze: (Model Talk Move #5, Wait time, and use Non-Verbal Signals)
- Have students share their responses to the problem about students (above).
- Ask students how they solved the problem.
- Encourage them to explain their thinking process and reasoning.

Allow students to practice Talk Moves #1, Revoicing, #2, Restating, #3, Applying own reasoning, and #4, Prompting for participation.

#### Introduce a Partner Math Game or Small Group Activity:
As a whole group, revisit the “IWT Expectations Chart” to review expectations. Introduce a new game and review the games rules. Model the new game/activity and have all the students play. Inform students that the new game will be added to the group rotation. Break the class into groups and have the students play today’s games plus the previously taught games/activities. Have them play 5-10 minutes and then rotate to a different game/activity.

---

**Materials:**
- Problem-solving chart
- Problem-solving notebook

Now that the class has experienced different games/activities and rotations, they should be able to work independently while the teacher works with a small group.
Grade 3-5: The First 10 Days
Launching Mathematics in the Common Core Classroom

CONGRATULATIONS!

You have worked hard to establish the following important routines and expectations with your students during the first ten days of school:

• Number Talks
• Daily Problem-Solving
• Listening and Speaking Expectations
• Talk Moves for Mathematical Discussions
• Non-Verbal Signals
• Expectations for Partner Games, Small Groups & Rotations, and Independent Work Time

By establishing and continuing to build these routines, your classroom is now a place where the Standards for Mathematical Practice can grow and thrive!

References and Resources:


Mental Math, Prince Edward Island Grade 3, 2008.

Mental Math, Prince Edward Island, Grade 4, 2008.
http://www.gov.pe.ca/photos/original/eecd_gr4math.pdf

Mental Math, Prince Edward Island, Grade 5, 2008.
http://www.gov.pe.ca/photos/original/eecd_gr5math.pdf

A community for number string design, http://numberstrings.com/

Teaching Channel videos:
• Third Grade Mental Math. https://www.teachingchannel.org/videos/third-grade-mental-math
• Improving Participation with Talk Moves. https://www.teachingchannel.org/videos/student-participation-strategy
• Three Phase Lesson, Grade 4, Multiplying Whole Numbers & Fractions. https://www.teachingchannel.org/videos/multiplying-fractions-by-whole-numbers-lesson
• Talk Moves. https://www.teachingchannel.org/videos/developing-communication-skills

Los Angeles Unified  •  Grades 3-5: First 10 Days of School  •  Adapted from Carroll County, MD
## First Ten Days of School: Number Strings Mini-lessons (Grade 5)

<table>
<thead>
<tr>
<th>Day</th>
<th>String Focus: Multiplication String - Relating Multiplication and Division, Equivalence, and Simplifying</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>String mini-lesson:</td>
</tr>
<tr>
<td></td>
<td>Students sit in a designated meeting area. Teacher charts the following expressions, one problem at a time.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 * 12</td>
</tr>
<tr>
<td></td>
<td>6 * 12</td>
</tr>
<tr>
<td></td>
<td>9 * 12</td>
</tr>
<tr>
<td></td>
<td>108/12</td>
</tr>
<tr>
<td></td>
<td>108/6</td>
</tr>
<tr>
<td></td>
<td>108/3</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>String crafting rationale:</td>
</tr>
<tr>
<td></td>
<td>The first three problems establish the foundation for the students to examine the relationship between multiplication and division. The third and fourth expressions relate inversely, further helping students to see the relationship of multiplication and division. The star is the multiplication sign used in middle school. The fraction bar is the division sign.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>String Focus: Multiplication String – Associative and Distributive Properties, Multiplication by Ten</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>String mini-lesson:</td>
</tr>
<tr>
<td></td>
<td>Students sit in a designated meeting area. Teacher charts the following expressions, one problem at a time.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 * 4</td>
</tr>
<tr>
<td></td>
<td>3 * 40</td>
</tr>
<tr>
<td></td>
<td>5 * 4</td>
</tr>
<tr>
<td></td>
<td>5 * 40</td>
</tr>
<tr>
<td></td>
<td>5 * 41</td>
</tr>
<tr>
<td></td>
<td>5 * 39</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>String crafting rationale:</td>
</tr>
<tr>
<td></td>
<td>The first and third expressions are basic facts that relate to the second and fourth expressions. Each pairing helps to support the development of the associative property. For example, students can think of 3 * 40 as 3 * (4 * 10), or (3 * 4) * 10. The last two problems in the string further help students toward understanding distributive property, as 5 * 41 contains one more group of 5 than 5 * 40. For the final problem in the string, students may see that 5 * 39 is one less group of 5 than 5 * 40, or split 39: (5 * 30) + (5 * 9).</td>
</tr>
</tbody>
</table>
### First Ten Days of School: Number Strings Mini-lessons (Grade 5)

<table>
<thead>
<tr>
<th><strong>Day 3</strong></th>
<th><strong>String Focus: Multiplication String – Associative and Distributive Properties, Multiplication by Ten</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>String mini-lesson:</strong></td>
<td>Students sit in a designated meeting area. Teacher charts the following expressions, one problem at a time.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| | 5 * 8  
| | 5 * 80  
| | 6 * 7  
| | 6 * 70  
| | 6 * 71  
| | 6 * 69  |
| **String crafting rationale:** | The first and third expressions are basic facts that relate to the second and fourth expressions. Each pairing helps to support the development of the associative property. For example, students can think of 5 * 80 as 5 * (8 * 10), or (5 * 8) * 10. The last two problems in the string further help students toward understanding distributive property, as 6 * 71 contains one more group of 6 than 6 * 70. For the final problem in the string, students may see that 6 * 69 is one less group of 6 than 6 * 70, or split 69: (6 * 60) + (6 * 9). |

<table>
<thead>
<tr>
<th><strong>Day 4</strong></th>
<th><strong>String Focus: Multiplication String – Associative and Distributive Properties, Multiplication by Ten</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>String mini-lesson:</strong></td>
<td>Students sit in a designated meeting area. Teacher charts the following expressions, one problem at a time.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| | 3 * 5  
| | 6 * 5  
| | 12 * 5  
| | 24 * 5  
| | 36 * 5  
| | 36 * 50  
| | 36 * 0.5  |
| **String crafting rationale:** | The first four problems in this string begin by doubling the first factor while leaving the other factor the same. Thus, the students should see the pattern: the product will double accordingly. The last three problems in this string support the development of an understanding of the distributive property. The distributive property states that when a number is being multiplied by a particular factor, it is equivalent to multiplying the number by parts that make up the factor [e.g., 36 * 5 = (12 * 5) + (24 * 5)]. |
### Day 5

**String Focus: Division Number String – Relating Multiplication and Division, Equivalence**

String mini-lesson:

Students sit in a designated meeting area. Teacher charts the following expressions, one problem at a time.

<table>
<thead>
<tr>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>48/4</td>
</tr>
<tr>
<td>48/8</td>
</tr>
<tr>
<td>24/4</td>
</tr>
<tr>
<td>240/4</td>
</tr>
<tr>
<td>240/8</td>
</tr>
<tr>
<td>2400/8</td>
</tr>
<tr>
<td>4800/8</td>
</tr>
<tr>
<td>4.8/8</td>
</tr>
</tbody>
</table>

String crafting rationale:

This mental math mini-lesson uses a string of related problems designed to encourage students to use division they know to figure out other more difficult problems.

### Day 6

**String Focus: Division Number String**

String mini-lesson:

Students will sit in a designated meeting area. Teacher will chart the following expressions, one problem at a time.

<table>
<thead>
<tr>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>48/4</td>
</tr>
<tr>
<td>48/8</td>
</tr>
<tr>
<td>24/8</td>
</tr>
<tr>
<td>240/8</td>
</tr>
<tr>
<td>240/16</td>
</tr>
<tr>
<td>2400/16</td>
</tr>
<tr>
<td>4800/16</td>
</tr>
</tbody>
</table>

String rationale:

This mental math mini-lesson uses a string of related problems designed to encourage students to use division they know to figure out other more difficult problems.
<table>
<thead>
<tr>
<th>Day 7</th>
<th><strong>String Focus: Addition Number String – Keeping One Number Whole and Taking Leaps of Ten</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>String mini-lesson:</strong> Students sit in a designated meeting area. Teacher charts the following expressions, one problem at a time.</td>
<td></td>
</tr>
</tbody>
</table>
| 15/5  
150/5  
300/5  
305/5  
300/15  
3000/15  
3015/15 |

**String rationale:** This mental math mini-lesson uses a string of related problems designed to encourage students to use division they know to figure out other more difficult problems.

<table>
<thead>
<tr>
<th>Day 8</th>
<th><strong>String Focus: Multiplication String</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>String mini-lesson:</strong> Students will sit in a designated meeting area. Teacher will chart the following expressions, one problem at a time.</td>
<td></td>
</tr>
</tbody>
</table>
| 2 * 10  
3 * 10  
6 * 10  
6 * 20  
6 * 200  
6 * 0.2 |

**String rationale:** The first three expressions in the string explore the product of each factor when multiplied by ten. The fourth expression supports students’ exploration of what occurs when a factor is doubled, and the fifth when the same product is multiplied by a power of ten.
### Day 9

**String Focus: Multiplication – Doubling, Doubling, and Halving**

String mini-lesson:

Students sit in a designated meeting area. Teacher charts the following expressions, one problem at a time.

<table>
<thead>
<tr>
<th>1 * 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 * 12</td>
</tr>
<tr>
<td>4 * 12</td>
</tr>
<tr>
<td>8 * 12</td>
</tr>
<tr>
<td>8 * 120</td>
</tr>
<tr>
<td>8 * 1.2</td>
</tr>
</tbody>
</table>

String crafting rationale:

The first four expressions explore what happens to the product when one factor is doubled. The remaining two expressions in the string allows students to explore when 12 is multiplied or divided by a power of ten.

### Day 10

**String Focus: Multiplication – Relating Multiplication, Division, Place Value**

String mini-lesson:

Students sit in a designated meeting area. Teacher charts the following expressions, one problem at a time.

<table>
<thead>
<tr>
<th>250/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>2500/10</td>
</tr>
<tr>
<td>25,000/10</td>
</tr>
<tr>
<td>10,000/100</td>
</tr>
<tr>
<td>100,000/100</td>
</tr>
<tr>
<td>1,000,000/1000</td>
</tr>
</tbody>
</table>

String crafting rationale:

Each problem in this string involves division by a power of ten. In the third through fifth expressions, using the powers of ten will allow students to examine the place value in both the dividend and divisor.
Math Constructive Conversation Skills Poster

Clarify Problem and Ideas for Solving It

*Prompt starters:*
- What are we trying to do?
- What is the problem asking?
- How does the problem begin?
- What happens in the problem?
- What do we need to know?
- How can we break this down?
- What type of problem is this?
- What patterns do we notice?
- What’s a possible plan for solving it?
- What is your estimate for the answer?
- Why are you doing that?
- Where did that number come from?

*Response starters:*
- In order to…, we need to…
- More specifically, it is… because…
- Let’s see, it is similar to the problem about… that we did because…
- It is important to… because…
- Let’s stay focused on…
- Let’s get back to the idea of…
- In future problems like this one we need to remember to…

Generate & Try Multiple Methods & Representations

*Prompt starters:*
- How else can we show this?
- How can we draw or graph this?
- What symbols can we use?
- How can we explain this to others?
- How can we write what we are thinking/doing?
- How can we translate this into symbols?
- Let’s back up and try a different way.
- Which method is most useful? Why?

*Response starters:*
- Maybe we can use…
- Another way to show this is…
- In math symbols we could write…
- We can draw it like this because it says…
- Let’s try to… and see what happens.

Build Math Solutions, Ideas, & Understandings

Explain & Support Reasoning

*Prompt starters:*
- Can you explain why you…?
- What does that mean?
- What are you doing?
- What math rule are you using?
- Can you give an example?
- How does the sample problem help us?
- What are examples of this problem from real life?
- Can you clarify where you…?
- How did you get this answer?

*Response starters:*
- If we…, then we need to…
- A key mathematical principle is making sure that you…
- In real life this is similar to when you want to…
- An example from my life is…
- One case that illustrates this is…
- In math, we always need to…
- Let me show you what I mean.
- We can’t do that because it…

“rules” e.g. verify

Negotiate Ideas

*Prompt starters:*
- How can we add to the idea of…
- What do you think about this strategy for solving it?
- What else could support this idea?
- Do you agree?
- What contradicts this? What are other points of view?
- What did we learn from doing this problem? How will it help in life?
- Let’s create a similar problem.

*Response starters:*
- That reminds me of…
- I want to add on to your idea of…
- That idea connects to…
- I see it a different way, On the other hand, …
- That makes me think of…
- We can agree that…

<table>
<thead>
<tr>
<th>Number Talks Item</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher Presents the Problem (~3 minutes)</strong></td>
<td>The teacher: • presents a problem with dot cards (K-1) or computation problems. • provides wait time for the majority of students to access the problem. • prompts the students to use a “thumbs-up” as the signal that they have an answer.</td>
<td>The teacher: • All criteria in the previous level, PLUS... • selects a problem/dot card designed to elicit a particular approach. • notices the types of mental computation strategies students use especially those that are inefficient, i.e., use of fingers or writing the problem on the floor. • anticipates how students will respond by thinking through possible strategies for each problem beforehand. • asks students to think on their own and to estimate before they compute. • removes pencil and paper from students access.</td>
<td>The teacher: • All criteria in the previous level, PLUS... • selects a well-crafted series of problems/dot cards that align with the teacher’s purpose. • notices the types of mental computation strategies students use and provides further instruction with alternative strategies at another time. • <strong>periodically</strong> encourages students to keep thinking about the number of additional strategies that will work and indicate the number of strategies on their fingers. • uses a real-life context to help students access the math.</td>
<td>The teacher: • All criteria in the previous level, PLUS... • increases the rigor of the problems over time. • <strong>consistently</strong> has students think of more than one strategy that will work and indicate the number of strategies on their fingers. • provides targeted small group instruction to those students needing additional instruction/practice.</td>
</tr>
<tr>
<td><strong>Teacher Records Answers (~1 minute)</strong></td>
<td>The teacher: • records all answers to be considered.</td>
<td>The teacher: • All criteria in the previous level, PLUS... • records all answers to be considered without giving any verbal or physical expressions of agreement. • has students share answers.</td>
<td>The teacher: • All criteria in the previous level, PLUS... • periodically uses overt methods such as number cards (K/1) or whiteboards etc. to elicit the answers of all students. • has students discuss which answers are reasonable and which answers could be ruled out</td>
<td>The teacher: • All criteria in the previous level, PLUS... • keeps records such as checklists, anecdotal notes of students’ answers and/or participation. • strategically chooses when students will use overt methods to reveal answers • discusses reasonableness of answers based on logic and number sense.</td>
</tr>
</tbody>
</table>
## Number Talks Innovation Configuration Map

<table>
<thead>
<tr>
<th>Number Talks Item</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher</strong>&lt;br&gt;Records&lt;br&gt;Student&lt;br&gt;Thinking&lt;br&gt;(~8 minutes)</td>
<td>The teacher: <em>provides opportunities for several students to share their strategies.</em>&lt;br&gt;<em>records student thinking.</em>&lt;br&gt;<em>resources are displayed such as ten frames, hundreds charts and number lines.</em></td>
<td>The teacher: <em>All criteria in the previous level, PLUS...</em>&lt;br&gt;<em>occasionally uses Talk Moves to help students explain their thinking and/or orient their thinking to others with little student engagement or discussion.</em>&lt;br&gt;<em>records student thinking in a mathematically correct manner by using proper notation.</em>&lt;br&gt;<em>displays sentence and question starters to help students frame their questions and comments.</em>&lt;br&gt;<em>periodically references resources that are displayed such as ten frames, hundreds charts, number lines and strategy posters.</em>&lt;br&gt;<em>regularly provides opportunities for students to orally practice using displayed sentence/question starters to help frame their questions and comments.</em></td>
<td>The teacher: <em>All criteria in the previous level, PLUS...</em>&lt;br&gt;<em>regularly uses Talk Moves</em>&lt;br&gt;<em>records student thinking using numbers as well as pictures, open number lines, area models, etc. as appropriate.</em>&lt;br&gt;<em>regularly references tools that are displayed such as ten frames, hundreds charts, number lines and class created strategy posters.</em></td>
<td>The teacher: <em>All criteria in the previous level, PLUS...</em>&lt;br&gt;<em>invites students to explain thinking to the class by drawing pictures, open number lines and area models when appropriate.</em>&lt;br&gt;<em>strategically uses a variety of Talk Moves to further classroom discussion and understanding of the mathematics.</em>&lt;br&gt;<em>strategically references tools that are displayed such as ten frames, hundreds charts, number lines and class created strategy posters and asks students to reference those tools during their explanation.</em></td>
</tr>
<tr>
<td><strong>Further Discussion</strong>&lt;br&gt;(~3 minutes)</td>
<td>The teacher: <em>may or may not provide opportunities for further discussion.</em>&lt;br&gt;<em>limits the number talks to 10 to fifteen minutes.</em></td>
<td>The teacher: <em>provides opportunities for further discussion.</em>&lt;br&gt;<em>leads a discussion that identifies the correct answer.</em>&lt;br&gt;<em>calls out new strategies used.</em></td>
<td>The teacher: <em>All criteria in the previous level, PLUS...</em>&lt;br&gt;<em>leads a discussion on the most efficient strategy rather than asking for the correct answer to a problem.</em></td>
<td>The teacher: <em>All criteria in the previous level, PLUS...</em>&lt;br&gt;<em>using Talk Moves, facilitates class discussion in which students explain which strategy they believe is most efficient and why.</em>&lt;br&gt;<em>asks students if other problems presented during the session can be solved using the new strategy and if it would be the most efficient for that particular problem.</em></td>
</tr>
</tbody>
</table>

### Materials/Resources
- Number Talks; Helping Children Build Mental Math and Computation Strategies Grades K-5, Sherry Parrish - available at all school sites in the principal’s office
- Dot Cards and Problem Set packets were distributed in K-1 math content training in 2013-2014 and are posted on the math intranet – instructional tools – Elementary – Number Talks
- Rekenreks will be introduced in Grade 1 during the 2014-2015 school years. Rekenreks are composed of two rows of stringed beads, each with 5 beads of one color and 5 beads of another color. They are used to help students build fluency with numbers 0 – 20, and compute using number relationships.
5 Talk Moves

*Increasing Rigor in Classroom Discussion*

1. **Revoicing** – Paraphrasing some or all of what the student has said and asking them to verify if your statement was correct. Can be done by teacher-listener or student-listener.

   “So you’re saying...”

   This talk move helps bring clarity to the student’s response for both the speaker and the listener.

2. **Restating** – Asking students to restate someone else’s reasoning.

   “Can you repeat what Philip just said in your own words?”

   This move validates the speaker, helps the listeners follow the speaker’s reasoning, and gives ELL’s and those who need more thinking time a chance to process the information.

3. **Applying Own Reasoning** – Asking students to apply their own reasoning to someone else’s statement.

   “Do you agree or disagree with that statement? Why?”

   Explaining thinking is critical to mathematical learning. This move also highlights the speaker’s thought processes.

4. **Prompting for Participation** – Inviting students to join the discussion.

   “Would someone like to add on?”

   This move can be used alone to invite students into the conversation or in conjunction with the other moves to keep the discussion active.

5. **Wait Time** – Allowing for a few moments of silence after a student has been asked a question.

   “Take your time....we’ll wait”

   At least 10 seconds is a good amount of time to be given between asking a question and choosing a student to respond. The same amount of time is also necessary to give the chosen student time to organize their response after being called upon. This gives ELL’s and those who need more time a chance to think the question through and contribute to the discussion. More points of view are added to the discussion.
# Three-Phase Structure for Problem Solving

## BEFORE (5 minutes)

<table>
<thead>
<tr>
<th>Role of the Teacher</th>
<th>Student Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activate prior knowledge</td>
<td>What am I trying to find?</td>
</tr>
<tr>
<td>Review vocabulary</td>
<td>o I am trying to find...</td>
</tr>
<tr>
<td>Pose the problem</td>
<td>What do I know?</td>
</tr>
<tr>
<td>Ensure that students understand the task</td>
<td>o I know that...</td>
</tr>
</tbody>
</table>

## DURING (20 MINUTES)

<table>
<thead>
<tr>
<th>Role of the Teacher</th>
<th>Student Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Let students independently work in pairs or groups</td>
<td>I solved the problem in more than one way.</td>
</tr>
<tr>
<td>Observe and facilitate as students work</td>
<td>I explained my solution to my partner.</td>
</tr>
<tr>
<td>Ask questions to focus, assess, and advance student thinking</td>
<td>I asked my partner questions so that I understand his/her solution.</td>
</tr>
<tr>
<td>Decide which solutions will be selected for sharing</td>
<td>I made my solution or answer to the problem clear so that others will understand it.</td>
</tr>
</tbody>
</table>

## AFTER (15 minutes)

<table>
<thead>
<tr>
<th>Role of the Teacher</th>
<th>Student Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have two to three students share their thinking and work with the whole group</td>
<td>What questions do you have for the mathematician?</td>
</tr>
<tr>
<td>Orders selected solutions to help generate mathematically productive discussion</td>
<td>o I’m wondering... Why did you... How did you...</td>
</tr>
<tr>
<td>Asks specific questions so that students will:</td>
<td>Who can restate how ____ solved the problem?</td>
</tr>
<tr>
<td>o Develop understanding of the concept</td>
<td>o First... Next... Then...</td>
</tr>
<tr>
<td>o Add on to and question the solutions shared</td>
<td></td>
</tr>
<tr>
<td>o Make connections between the solutions presented</td>
<td></td>
</tr>
<tr>
<td>o Identify patterns</td>
<td></td>
</tr>
<tr>
<td>o Find generalized characteristics within the problem</td>
<td></td>
</tr>
<tr>
<td>Listen actively without evaluation</td>
<td></td>
</tr>
<tr>
<td>Summarize the main idea and identify next steps, future problems</td>
<td>What is the same about the solutions shared? What is different?</td>
</tr>
<tr>
<td></td>
<td>o One similarity is... Both solutions... One difference between the solutions is...</td>
</tr>
</tbody>
</table>
Appendix

**Number Talks** are short, daily classroom conversations around purposefully crafted computation problems that are solved mentally. Sample Number Talk problems can be found from a variety of sources.

**Resources:**

Math Perspectives: [http://www.mathperspectives.com/num_talks.html](http://www.mathperspectives.com/num_talks.html)


Number Strings: [http://numberstrings.com/](http://numberstrings.com/)

**Three Phase Problem-Solving:**
Sample Problems/Tasks may be selected from the enVision MATH materials, which are found in the following parts of the program:
- Problem-based Interactive Learning in each lesson
- Problem of the Day
- Daily Spiral Review
- Problem Solving section, after the Independent Practice, of each lesson
- Mixed Problem Solving
- Quick Check, Writing to Explain
- Leveled Homework, Writing to Explain