Getting Started

In the first weeks of school, you will want to establish the basis for your math instruction, classroom organization, and student expectations. The goal is to promote and increase the Levels of Discourse and raise the level of students’ thinking as evidenced by their explanations (using both numbers and writing). Also, some ideas have been given for planning, scheduling, and organizing curriculum and student evaluation tools.

- Classroom Norms
- Accountable Talk
- Levels of Classroom Discourse
- Rug Procedures
- Growth Mindset Student Survey
- Setting Up Student Journals (Optional)
- Rubric
- Explaining Your Thinking
- Teacher Pages
  - Tracking Problem Types
  - Suggested Schedule
You’ll decide on a set of **Classroom Norms** for doing mathematics in your classroom. Whatever your method, it’s important to pay explicit attention to the norms you want to foster. Here are two examples, but there are many different lists to choose from. It might be beneficial to work across your grade level to foster similar norms throughout the classrooms.

![Figure 2: Discussion Expectations](image)

**Math—Discussion Expectations**

In our learning community we...

1. Treat each other with respect at all times
2. Give each other time to think
3. Participate in the discussion
4. Speak loudly enough so others can hear
5. Listen to a speaker’s idea
6. Repeat a speaker’s idea (can you...)
7. Explain why you agree or disagree with a speaker’s idea
8. Remember that it is okay to make mistakes and revise our thinking
In this class we will...

- Make sense of mathematics
- Keep trying even when the problems are challenging
- Remember it’s okay to make mistakes and revise our thinking
- Share our mathematical ideas with our classmates (using words, numbers, pictures, gestures, or tools)
- Listen to understand someone else’s idea; give each other time to think
- Ask questions that help us better understand the mathematics
- Agree and disagree with mathematical ideas, not with each other
- Remember that everyone has good math ideas
# Accountable Talk

## Talk moves

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revoicing</strong>&lt;br&gt;“So what you’re saying is...”&lt;br&gt;− Repeat what students was trying to say and clarify with student.</td>
<td><strong>Reasoning</strong>&lt;br&gt;Agree or Disagree?&lt;br&gt;“I respectfully agree..... I respectfully disagree...”&lt;br&gt;“That makes sense to me because...”</td>
</tr>
<tr>
<td><strong>Repeat</strong>&lt;br&gt;“Can you repeat what they said using your own words?”</td>
<td><strong>Repeat</strong>&lt;br&gt;“What I think _____ was trying to say was....”</td>
</tr>
<tr>
<td><strong>Adding on</strong>&lt;br&gt;“Would someone like to add on to this?”</td>
<td><strong>Adding on</strong>&lt;br&gt;“I’d like to add on....”&lt;br&gt;“Adding on to what _____ said....”</td>
</tr>
<tr>
<td><strong>Turn and talk</strong>&lt;br&gt;“Turn in talk to your neighbor”</td>
<td><strong>Turn and talk</strong>&lt;br&gt;“I think...because... and I figured it out by......”</td>
</tr>
<tr>
<td><strong>Revise</strong>&lt;br&gt;“Has anyone’s thinking changed?”&lt;br&gt;“Would you like to revise your thinking?”</td>
<td><strong>Revise</strong>&lt;br&gt;“I thought... But now I think....”&lt;br&gt;“I’d like to revise my thinking...because....”</td>
</tr>
</tbody>
</table>

*Can be found in Intentional Talk text by Kazemi & Hintz pg. 21*
**Math Talk Moves**

**Revoicing**
“So you’re saying that ________. Do I have that right?”

**Repeating**
“Can you restate or rephrase what __________ just said?”

**Reasoning**
“Do you agree or disagree, and why?”

**Adding On**
“Would someone like to add on?”

**Waiting**
“Take your time...we’ll wait...”

**Turn & Talk**
“Partner turn and talk or think-pair-share”

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*Summary Tables of Productive Talk Moves* from Classroom Discussions in Math: A Teacher’s Guide for Using Talk Moves to Support the Common Core and More, Grades K-6 by Suzanne H. Chapin, Catherine O’Connor, and Nancy Carnahan Anderson. Copyright © 2013 by Scholastic Inc. All rights reserved. Item #: 594852.

**Math Solutions** | mathsolutions.com
Math Talk Moves
To help you learn and think critically about Math

**Revoicing**
Restate what someone else is saying by repeating, summarizing, rephrasing, or translating his/her words.

So you're saying that ....

**Repeating**
Repeat what someone said to show that what he/she said was heard and understood.

So, Hector is saying ....

**Reasoning**
Think about what someone else is saying and compare your reasoning to his/her reasoning.

I disagree with Keli's solution because ....

**Adding On**
Connect your thoughts and ideas to what someone else is saying.

Rob is right! But I want to add ....

**Wait Time**
Give others time to think about the problem or discussion and time to respond.

Leigh, I'll give you time to think about the answer.

**Revise Your Thinking**
After listening to the thoughts and ideas of others, make changes to your thinking.

After listening to Reggie, I think the answer should be ....

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Rug Procedures

Hand signals

- When student comes up with their answer they don’t raise their hand. They place their thumb on their chest.

- If the student has more than one strategy, they can show that by putting another finger (to encourage students to continue thinking about the problem).

- Signal for when someone shares and if students agree with them and had the same/similar response. Ex. “Me too” sign language
Sample of Classroom Structure

Monday:
Number of the Day - with the day of school
BRASSY - Data Dump
Routine - see brown Routine book
Word Problem - see Problem Type
Game

Tuesday:
Number of the Day
BRASSY - Graph
Routine
Targeted Discussions from yesterday's WP
Intentional Talk
Counting Collections - see article
Game

Wednesday:
Number of the Day
BRASSY - Measurement
Routine
Word Problem
Game

Thursday:
Number of the Day
BRASSY
Routine - Time
Targeted Discussions from yesterday's WP
Counting Collections
Game

Friday: Option Math Centers
Number of the Day
BRASSY - Geometry
Routine
Word Problem
Game

This is just a place to get started. There is no right way "to do" CGI. It is a philosophy that engages students to think. This has worked for us to dive in. We are constantly adjusting.
# Levels of Classroom Discourse

*From Principles to Actions: Hufford-Ackles, Fuson, and Sherin (2014)*

## Student Friendly Version (DUSD)

<table>
<thead>
<tr>
<th>Level</th>
<th>WHO’S ASKING THE QUESTIONS?</th>
<th>HOW DO I EXPLAIN MY MATH THINKING?</th>
<th>HOW DO I SHOW MY MATH THINKING?</th>
<th>AM I DOING MY JOB IN OUR MATH COMMUNITY?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 0</td>
<td>Is my teacher asking all the questions? Am I responding minimally to the question?</td>
<td>I respond to a question if I only know the right answer. I only explain if my teacher asks me to.</td>
<td>My teacher showed me a drawing to show my thinking.</td>
<td>I wrote my answer and idea but did not share with any classmates.</td>
</tr>
<tr>
<td>Level 1</td>
<td>Am I starting to think a little bit more? Am I asking any questions?</td>
<td>I am starting to explain my thinking rather than just my answer.</td>
<td>I can make a drawing to show my math thinking.</td>
<td>I gave my answer, I listened to others and can restate my classmates ideas.</td>
</tr>
<tr>
<td>Level 2</td>
<td>My classmate is asking questions that I can think about or respond to?</td>
<td>My explanations are getting stronger because my classmates are asking questions of my thinking. I am also asking questions of their thinking.</td>
<td>I label my drawing so that my classmates understand my math thinking.</td>
<td>I know my idea and my classmates ideas are both important, so I listen closely and try their strategies too.</td>
</tr>
<tr>
<td>Level 3</td>
<td>My classmates are really thinking and asking great questions. Now I am wondering about their questions and answers. I am responding and asking why and how?</td>
<td>Everyone is listening and explaining their thinking with one another. We are asking why and justifying our thinking.</td>
<td>I share my drawing to explain my strategy, I listen to my classmate share their drawing, then we can work together to edit our drawings to better show our math thinking.</td>
<td>I teach my strategies to my classmate, learn the strategies of my classmates and work together to practice good math thinking together.</td>
</tr>
</tbody>
</table>
## Growth Mindset

**Mathematiciah __________________**

Date ________ Teacher ________ Grade ____

<table>
<thead>
<tr>
<th>Statement</th>
<th>Most of the Time</th>
<th>Some of the Time</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like doing math.</td>
<td>☑</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My teacher is interested in my math strategies.</td>
<td>☑</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Math is hard for me.</td>
<td>☑</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My classmates can learn from my math strategies.</td>
<td>☑</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I like to share my thinking in math class.</td>
<td>☑</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I look forward to math time.</td>
<td>☑</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

---

What does it mean to be good at math?
Setting Up Student Journals

Materials needed:
- Composition book/spiral notebook

Explanation:
- Have students solve the sample word problem, prior to starting anything (hopefully it’s a mess and unorganized)
- Share out (without embarrassment)
- Discuss why journal/responses need to be organized
- Create anchor chart “Organizing your math”
  - In the Notes/Problem section have the students glue a preprinted problem OR just take notes from a problem you have written on the board
  - Students should not be spending time LABELING their sections...they should quickly get to work and make sure they keep everything organized
- Have students solve same using the organized format
Molly has 4 crayons. Roger has 3 crayons. How many do they have altogether?

Number Sentence: ________________________
Solution: _______________________________

Molly has 4 crayons. Roger has 3 crayons. How many do they have altogether?

Number Sentence: ________________________
Solution: _______________________________

Molly has 4 crayons. Roger has 3 crayons. How many do they have altogether?

Number Sentence: ________________________
Solution: _______________________________

Molly has 4 crayons. Roger has 3 crayons. How many do they have altogether?

Number Sentence: ________________________
Solution: _______________________________

*Sample problem to use to establish beginning of year procedures*
<table>
<thead>
<tr>
<th>Organizing Your Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show your Thinking</td>
</tr>
<tr>
<td>Number Sentence/Equation</td>
</tr>
<tr>
<td>Label your Answer</td>
</tr>
<tr>
<td>Explain HOW you know</td>
</tr>
</tbody>
</table>
Rubrics

The following rubric is a guideline/example of how you can assess your student’s work. Create a rubric anchor chart to share with your students in order to set up expectations.

1st Grade Word Problem Rubric

<table>
<thead>
<tr>
<th>Accuracy: Yes No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanation (written or dictated): Yes No</td>
</tr>
<tr>
<td>Number Sentence to match thinking: Yes No</td>
</tr>
<tr>
<td>Label: Yes No</td>
</tr>
</tbody>
</table>

Total Points: 0 1 2 3 4

*Each “yes” is worth one point

4- Exceeds/advanced understanding 3- Met/complete understanding 2- Nearly met/developing understanding 1- Not met/minimal understanding 0- No response

FOR THE TEACHER

This progress monitoring sheets can be used for “ticket out” or daily word problems. It is not necessary to complete this for EVERY student for EVERY problem, choose small groups of students to assess each time.

https://docs.google.com/a/dusd.net/document/d/1yTuU2BedrZWcgW8lvfQ2UMqRn_GcYK1KyBnYVagXd90/edit?usp=sharing
**Sentence Frame**

1. First, I ________________________________________________.
2. Next, I ________________________________________________.
3. Then, I ________________________________________________.
4. The number sentence is ________________________________.
5. Finally, the solution is______________________________.
6. I solved this way because ________________________________.

**Math Word Bank**

drew  counted  made  fingers  
rod  crossed out  added  numbers  
strategy  picture  tallies  group  
together  equation  10 frame  subtracted  

**Tell Us “WHY”**

- The strategy I used was ________ because....
- Another strategy that would work is....
- I know my answer is reasonable because....
- I can prove my thinking by.....
Teacher Pages
Math Practice Standards

To emphasize the Mathematical Practices, the CCSS gives them their own distinct section, but they are not to be thought of as a separate skill set to be handled in special lessons or supplements. The intent is that these essential mathematical habits of mind and action pervade the curriculum and pedagogy of mathematics, K-12, in age-appropriate ways (http://thinkmath.edc.org/resource/ccss-mathematical-practices).

It is essential that Math Practice Standards* 1, 3, & 6 are executed on a daily basis & students understand the definitions & terminology of those standards.
The following pages can be used to track problem types

A new page will be needed for each trimester

Cover each problem type at least once in each trimester

Record each time a problem type is given
# Math Story Problem Types

<table>
<thead>
<tr>
<th>Table 1. Common addition and subtraction situations.³</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Result Unknown</strong></td>
</tr>
<tr>
<td>Add to</td>
</tr>
<tr>
<td>Join</td>
</tr>
<tr>
<td>Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now?</td>
</tr>
<tr>
<td>2 + 3 - ?</td>
</tr>
<tr>
<td>Take from</td>
</tr>
<tr>
<td>Separate</td>
</tr>
<tr>
<td>Five apples were on the table. I ate two apples. How many apples are on the table now?</td>
</tr>
<tr>
<td><strong>Total Unknown</strong></td>
</tr>
<tr>
<td>Put Together/ Take Apart⁵</td>
</tr>
<tr>
<td>Part-Part-Whole</td>
</tr>
<tr>
<td>Three red apples and two green apples are on the table. How many apples are on the table?</td>
</tr>
<tr>
<td>3 + 2 - ?</td>
</tr>
<tr>
<td><strong>Difference Unknown</strong></td>
</tr>
<tr>
<td>Compare⁸</td>
</tr>
<tr>
<td>(“How many more?” version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy?</td>
</tr>
<tr>
<td>(“How many fewer?” version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie?</td>
</tr>
<tr>
<td>2 + ? - 5, 5 - 2 - ?</td>
</tr>
<tr>
<td><strong>Multiplication</strong></td>
</tr>
<tr>
<td><strong>Unknown Product</strong></td>
</tr>
<tr>
<td>3 × 6 = ?</td>
</tr>
<tr>
<td>Equal Groups</td>
</tr>
<tr>
<td>Measurement example. You need 3 lengths of string, each 6 inches long. How much string will you need altogether?</td>
</tr>
<tr>
<td>First Grade Word Problem Progression</td>
</tr>
<tr>
<td>------------------------------------</td>
</tr>
<tr>
<td>Start Unknown</td>
</tr>
<tr>
<td>Change Unknown</td>
</tr>
<tr>
<td>Result Unknown</td>
</tr>
<tr>
<td>Add (Add to)</td>
</tr>
<tr>
<td>Subtract (Take from)</td>
</tr>
<tr>
<td>Multiply (Partitive)</td>
</tr>
<tr>
<td>Divide (Equal Groups)</td>
</tr>
<tr>
<td>Equal Groups</td>
</tr>
<tr>
<td>Part-Part-Whole</td>
</tr>
<tr>
<td>Both Addends Unknown</td>
</tr>
<tr>
<td>Whole-Part</td>
</tr>
<tr>
<td>Compare Smaller Unknown</td>
</tr>
<tr>
<td>Compare Greater Unknown</td>
</tr>
<tr>
<td>Compare Difference Unknown</td>
</tr>
<tr>
<td>Equal Groups</td>
</tr>
<tr>
<td>Part-Part-Whole</td>
</tr>
<tr>
<td>Both Addends Unknown</td>
</tr>
<tr>
<td>Whole-Part</td>
</tr>
<tr>
<td>Compare Smaller Unknown</td>
</tr>
<tr>
<td>Compare Greater Unknown</td>
</tr>
<tr>
<td>Compare Difference Unknown</td>
</tr>
</tbody>
</table>
Schedule

The following is a suggested schedule/planning sheet.

**Explanation:**
- Planning set up for a 60 minute lesson {adjust as needed}
- Each day indicate whether your lesson is a “word problem”, “counting collection”, “quiz”, etc...
- Fill in the “everyday section” for your everyday routines such as “number of the day”
- There is a section to fill in the “routine” that you choose to use each day
- Form can be typed in or written

If something doesn’t work for you adjust as necessary and share your successes with your team and Math Curriculum Lead.
**1ST GRADE MATH SCHEDULE**

### EVERY DAY

**Number of the Day:**

- Every day:
  - word prob/collection/other
  - Routine: _____

### SCHEDULE

**5 min: # of the day**

**5 min: BRASSY**

**15 min: Routine**

**35 min: WP/CC**

### TRIMESTER FOCUS

**Tri 1**

**Tri 2**

**Tri 3**

### MONDAY

{word prob/collection/other}

{Routine: _____}

### TUESDAY

{word prob/collection/other}

{Routine: _____}

### WEDNESDAY

{word prob/collection/other}

{Routine: _____}

### THURSDAY

{word prob/collection/other}

{Routine: _____}

### FRIDAY

{word prob/collection/optional math centers}

{Routine: _____}