



Mrs. Dixon's Math Strategies

*As a **Math Educator**, I implement a variety of strategies to not only help students learn and master the curriculum, but also enjoy the process of learning and see how math can open the doors to a bright future!*

Fluency Strategies

- **Beginning of the Year (BOY):**

To improve students' fluency of math facts and basic operations, I heavily rely on minute drills at the beginning of the school year, which we do at the start of the day. We also play games, like Around the World where students compete against each other to show the most mastery in facts.

- iPad or Computer Games: [Multiplication Grand Prix](#), [3rd and 4th grade multiplication facts levels in iXL](#)
- Paper + Pencil Practice: Multiplication minute drills... 24 in 1 minute (2 times tables at a time)... 60 in 3 minutes (mixed facts)... 100 in 5 minutes (mixed facts). My goal is for them to get 100 mixed facts done in less than 3 minutes. I also have them complete a blank multiplication table out in 7 minutes or less.
- Incentives: as students master their multiplication facts, their cars move on my multiplication grand prix bulletin board. For every 2 facts they master, they earn another part of an ice cream sundae.

- **Middle of the Year (MOY):**

As the year progresses, I have taught or review addition, subtraction, multiplication, and division, as well as fraction concepts. I want these skills to stay fresh, so I move beyond multiplication fact fluency to ensuring that students are accurate and consistent with other operations.

- iPad or Computer Practice: [iKnowIt.com](#) is phenomenal. They have so many skills that can be assigned to students and reassigned if they score below a certain percentage. Like [iXL.com](#), the program gives students a little tutorial if they get a problem wrong.
 - [iXL.com Student Accountability Sheets \(5th Grade Curriculum\)](#)
- Paper + Pencil Practice: [DynaMath](#) (now SuperSTEM) has some great DynaDash drills that take more than a minute, but can review key operations. In addition to this, I would make skills reviews some weeks, and at times, I just reviewed basic operations. I spent 3 days modeling and having students complete some problems on their own, and on the 4th day, they would have a mini-quiz over the basic operations.
- Incentives: I used [LiveSchool](#) to track students' points. For completing drills in a set time period, they could earn LiveSchool points/dollars, which they would use to get flexible seating, extra snacks, or an end of quarter party among other rewards.

- **Testing Time/End of the Year (EOY):**

By the end of the year, I want the students to be really accurate and consistent with all the taught skills, but especially basic operations. Also, I want them able to check their work so that they know they are accurate.

- iPad or Computer Practice: They still use [iKnowIt.com](#), but I want to see on notebook paper or grid paper where they checked their answers. I also raise their percentage required before levels get reassigned (higher SmartScores in IXL).
 - [iXL.com Student Accountability Sheets \(5th Grade Curriculum\)](#)

- Paper + Pencil Practice: We will play team review games, and there may be a race to the correct answer with work shown that checks the answer (solved with a second strategy or the inverse operation was used to check). Some games are not a race, but a team effort to get as many completed correctly as possible. Homework packets will include fluency practice as well.
- Incentives: Students who are fluent in operations and skills tend to progress more in the curriculum. For whatever program the school has invested in, I will reward students for mastering all or most of it either before testing or before the end of year. In DC, students were rewarded for completing 100% of [ST Math](#). In Texas, I rewarded students for achieving excellence or mastery on 80% or more of [iXL.com](#).
- **Stock Market:**
When I taught 5th grade, I had my students track specific stocks on the stock market. Each week, they tracked the price of the stock, and then they calculated the value of their shares of that stock. During the 2nd quarter, they had selected 2 stocks, and had to calculate the value of their portfolio as well. This allowed students to keep practicing their multi-digit multiplication skills as well as addition fluency.

Teaching New Lessons

- 3 – 4 new lessons per week
- Process Anchor Charts
- At times, I split my class into 2 groups and taught the lesson twice so that students in each group learned at a comfortable pace. This allowed me to go deeper for my advanced learners and explain more to those who needed it.
- Keep students engaged through **Nearpod** (with plenty of engagement) or PowerPoint Presentations, which also allow me to control the pace of the content.
 - Example: [Area and Perimeter Notes in PowerPoint](#)
- Mini-Lesson in paper pencil format (try to keep lessons to 30 minutes or less)
 - Example: [Adding Decimals with Models Worksheet + Home Practice](#)
- Multiple Representations or multiple strategies
 - Example: [Decimal and Fraction Equivalence with Multiple Representations and Expanded Notation](#)
 - Example: [Multiplication Toolbox Interactive Notebook Foldable](#)
 - Example: [Distributive Property Steps Sort \(2-, 3-, and 4-Digit\)](#)

Math Journaling / Note-Taking

- At least 2 entries per chapter
- These included vocabulary and examples
- Students always love the foldables!!!!
 - Example: [Multiplication Toolbox Interactive Notebook Foldable](#)
 - Example: [Area and Perimeter Notes in PowerPoint](#)

Hands-On Practice (or Practice with Models)

- Some lessons lend themselves more to manipulatives than others, but this is crucial in helping students really understand foundational mathematical concepts.
 - Example: [Adding Decimals with Models Worksheet + Home Practice](#)
 - Example: [Adding Decimals with Models Sort + Practice Worksheet](#)

Practice of New Skills

- After teaching a lesson on a new skill, I will often times use a “Rally Coach,” which is a *Kagan strategy*. With Rally Coach, I will craft a practice sheet with two sides for 2 partners. Each partner will be given a turn to explain how to do a particular process, like multiplying a 2-digit number by another 2-digit number. The other partner looks on the entire time. If the partner solving the problem does not quite get it, the other partner will coach him to the correct answer, by giving 2 tips and then a full explanation.
 - Example: [Rally Coach – Multi-Digit Multiplication](#)
 - Example: [Rally Coach: Lattice Method \(Multi-Digit Multiplication\)](#)
- ST Math has been an instrumental program in helping students learn and master a new skill. After I have taught the new skill, I will then move up the skill in ST Math through the Teacher Admin area. When students log in for that week to ST Math, they will be directed to the new level, unless they have already completed it, and they will have the opportunity to get a deeper understanding of the process of skill.
 - [ST Math by Mind Research](#)
- [iXL.com](#) has so many levels that most of the skills I taught have a corresponding iXL.com level. I try to get my students to aim for a SmartScore of 85 or better, and I will help struggling students as needed.
 - [iXL.com Student Accountability Sheets \(5th Grade Curriculum\)](#)
- [iKnowIt.com](#) has a lot of the skills I teach. I can have students practice a set number of questions, and then review their progress afterwards.
- Exit Tickets made up of 3 to 15 questions that help me know whether students understand the skills. Since Texas end of year assessments are made up primarily of multiple-choice questions, I try to have several multiple-choice questions on my exit tickets. Examples below.
 - [Adding Decimals with Models Worksheet + Home Practice](#)
 - [Decimal and Fraction Equivalence with Multiple Representations and Expanded Notation](#)
 - [Distributive Property Steps Sort \(2-, 3-, and 4-Digit\)](#)
 - [Factors, Multiples, Equivalent Fractions, and Simplest Form Worksheet](#)
 - [Place Value Review Worksheet to the Hundred Thousands](#)
 - [Place Value Rounding Worksheets and Home Practice](#)

Music and Videos

- [Math Antics](#) – great tutorial videos with some humor and great explanations
- [NumbeRock](#) – great songs that tie into math concepts; students love these and you will too!
- I create my own videos as needed to supplement instruction. Some years, I pre-taught a skill through a homework video with an accountability worksheet that students completed as they watched. I also used videos to extend my coaching time with UIL Number Sense students.

Challenge Problem

- Exemplars
- Higher Order Thinking (HOT) Problems
 - Example: [Area & Perimeter Challenge Activity](#)
 - Example: [Find Multiplication Mistakes Task Cards \(2 Digit x 2 Digit Error Analysis\)](#)

Reading About Math

- [DynaMath](#) (This is now SuperSTEM)
- Jigsaws – This is a strategy I learned through AVID where you assign a reading passage and have different students focus on specific aspects of the passage. Afterwards, the students come together to discuss the article and summarize it. I used this approach with a variety of written or modified reading passages that may pertain solely to the math skill or may discuss how a profession uses this math skill in their line of work.

Real World Application

I always like to make math relevant, so I make it a point to come up with projects that tie in the skill we have learned to a real-world situation. These typically become projects that take multiple days to complete. Some tasks are group assignments, while others are individual assignments. In each case, my students have enjoyed the process and told me that this was not “math.” At the conclusion of our angles unit, students had to create a Christmas tree or Christmas present by following directions and correctly drawing angles with their protractor. At the end of our multiplication and division unit, students had to create a menu and guest lists for a Thanksgiving Dinner party. They needed to make sure that they purchased enough food so that everyone could eat.

- Example: [Olympics Review Activity](#) (Place Value)
- Example: [Texas Missions Review Activity](#) (Area and Perimeter)
- Example: [Thanksgiving Project](#) (Multiplication and Division Skills)
- Example: [Catering a Thanksgiving Dinner Task Cards](#) (Fraction and Decimal Operations)
- Example: [Christmas Tree Project](#) (Drawing and Measuring Angles)
- Example: [Making Big Purchases in the Real World Activity](#) (Adding Decimals)
- Example: [Black History Timeline](#) (Fraction and Decimal Equivalence)
- Weekly Stock market Tracking (Addition, Subtraction, and Multiplication of Decimals)

Students as Teachers

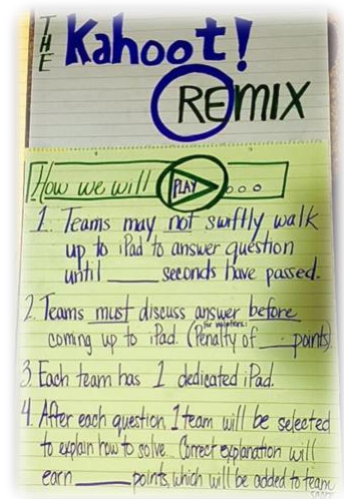
When I have been a student, I always found that I knew more when I prepared to explain to my peers what we should have learned. In a similar way, I like to empower my learners to share from their perspective how they go about solving problems. I would sometimes simply have a student come in front of the class and guide their peers through completing a practice sheet. I sometimes paired higher-performing students with students that needs more assistance, and we did a Rally Coach Kagan structure to complete practice problems. Each student would have the opportunity to “teach” if their partner got stuck. They were encouraged to “tip, tip, teach.”

Math Procedural Writing

Writing is a key 4th grade skill that is assessed on our yearly high-stakes testing. Knowing this was an area that our students were not as strong in, I implemented **Math Procedural Writing** into our 4th grade math block, which we did every other week. During this time, I would model the writing process of planning, drafting, revising, and writing a final draft to a review skill, like making an equivalent fraction. Students had access to a transition word bank and they were able to develop their own topic and concluding sentences for the writing. Students had one day of teacher modeling, followed by a day or two of guided practice, and then another day or two of independent or partner practice. On the fourth or fifth day, students would have to demonstrate their understanding of the skill by responding to a writing prompt very similar to the writing prompts they had seen all week.

Reviewing Skills

- **Games** have been my most successful and well-received strategies for reviewing content with my students. To get my boys initially interested and to keep them engaged, I have used a number of **basketball-themed review games**. However, when we completed our **American Revolution** unit, I created a fraction review game with that team. How the games typically work is that there will be groups of mixed ability levels. I tried to even the teams out with a good mix of my highest students and the others. Each game has some level of peer coaching involved, and in some games, the highest students are only allowed to coach and not directly answer. Some games have built in opportunities to keep the scores competitive with things, like “sneak attack points” and “unified team points” as well as “quiet points.” Not only do these extra points potentially keep the scores close, but they also help with the classroom management. I have typically played these games with as few as 12 students to as many as 45.
 - When my students first discovered Kahoot, they loved it! I, on the other hand, quickly lost interest because my students were not consistently thinking. They wanted to answer first, regardless of whether it was right or wrong. I tasked my 6th graders with coming up with a new game format, and they came up with a **Kahoot Remix**! I loved this version so much, that this is the main way I will play with my students now.
 - One year, we also played a series of competitions with an **Olympics’ theme**. This was around our data and measurement unit, and we incorporated math computations and conversions into these “mini-competitions.”
 - Every March/April, I love having an actual **March Madness basketball tournament**, where rankings are formed from rounds of math games.
- My students have also enjoyed playing **Scavenger Hunts**, where I hide numbered problems around the room. Students find the problems and then work as a team to solve them. They have a set amount of time, but they want to get the most done in that limited time.
- Every other week, we have a **Skills Review**. During our math skills review, I model a review skill, and then students practice it in the “Your Try” column, and if they still have extra time before I move on to the next skill, they can do the “Extra Time” column. I have been using this strategy for the past 3 years, and I know that this has helped students not forget skills as more and more are learned. We will have 3 variations of the skills review for 3 consecutive days, and on the



fourth day, the students will take a Skills Review Quiz with the same type of problems that we worked on all week. The skills reviews were great for key skills, like multiplication of 2-digit numbers by other 2-digit numbers and long division because students did not initially get this skill. The reviews allowed up to keep modeling the skill for students and then let them try it on.

- As stated in the section above, the **Math Procedural Writing** also proved to be a review of sorts for students as they wrote down the steps to perform a mathematical operation for at least 3 days, and then they were tested on the skill.

Chapter/Unit/Quarter Review

With assessments in mind, I made sure that I had review time built into my plan. Other than games, here are other tools/structures I would use:

- Quiz Quiz Trade (Kagan structure)
- Tour of Knowledge (learned from Relevant Review Seminar by Lead4ward)
- Error Analysis (Example: [Find Multiplication Mistakes Task Cards \(2 Digit x 2 Digit Error Analysis\)](#))
- Be a Detective – students have multiple choice questions, and each group must explain why their assigned answer choice is correct or incorrect.
- Modeling test taking strategies
- Class completion of a challenge test a day or so before the real test is given

Assessment

I love quality assessments. I seldom give an unmodified assessment from a textbook because I don't need to know if you can select the correct answer. I want to see strategies and each students' thinking. I often use the questions from a textbook assessment, and I may put them in a format where they can model the problem or solve with more than 1 strategy.

- Teacher-made assessments
- Assessment where a select number of questions are answered by students (given 1 or 2 counting chips). They can volunteer to come up to document camera and solve the problem. After they are finished, if someone disagrees with the previous answer, they can use their chip and explain what they feel the correct answer is. After this open session, students complete the remaining questions independently.
- Contextualized application of a taught skill; this may look like a project.

Everything is Taught, Now What?

My last 5 years of teaching, I finished teaching content before STAAR testing. With that extra time, my students completed a [Career Research Project](#). In 5th and 6th grades, this became a 3-week college and career project. Regardless of the grade-level, I provide scaffolded with graphic organizers and really allows students to create an end-product they can be proud of!