Questions for Math Minds

Question	Response
What technology/app would you recommend for students to practice their math facts and to keep track of their automaticity?	Many of the technology games I have used focus on time or randomly assigning facts. I would like to find a digital component that focuses first on strategy, and number choice and then gives games to practice and verbalize/explain strategy and lastly adds the time component. Using strategies **initially** takes longer than quickly counting but is a required step in the process of developing automaticity. Drill is appropriate after students have a toolbox of strategies (after phase 2) they are using and should be low-stress and fun.
Thoughts on Xtra Math?	I am not familiar with it.
Can we reinforce practicing facts at home or should this be done primarily during the school day?	Home involvement is key. Ask students to teach their parents the strategies 😊 and how the strategies help to solve other problems.
How do students check each other's sums in fixed addend?	Implement the use of a calculator to help students check work.
How do you address a student who has memorized but can't communicate the reasoning?	It is important that students and parents understand the strategies are proven to help advance the thinking during multi-digit operations.
Can you share some ideas/games for make a ten strategy?	Fish for ten is my favorite.
How would you recommend presenting these strategies to middle school students who don't know their facts or strategies for determining them?	The use of quick flashes and being very intentional with the problem strand is important.
What is the name of a Math Fact Fluency Game Book?	Math Fact Fluency by Jennifer Bay-Williams and Gina Kling
How do you know when to play a game that requires strategies?	First, we need to think about the game and what is required. In the example, fixed factor war if we want to target a doubling strategy we would choose 2 as our first "fixed" factor. Next, we would choose 4 as the "fixed" factor and model the sentence strands for students to build an impression. In fixed addend war, if

	we are targeting +9, we may start with +10 as our "fixed" addend and then move to +9. It is important that we are modeling the thought process as this may not be the natural thinking. Games in the book, like First to 20, may require the use of multiple strategies because the structure of the game does not target a specific strategy. The numbers used throughout the game can also dictate the strategies. This is a great way to differentiate for your students.
When playing fixed addend war, would we want students to just know which sum is greater, without figuring out each sum?	Part of number sense is reasoning about the result without solving it, but I suppose in practicing facts we would want the students to actually use a strategy to solve it. 😊You may require both the sum and the strategy used to solve it. Challenge students to think about how different strategies could be used and form an opinion about which strategy they feel is best.
When playing fixed addend war, can you play a version where the students roll a more/less die to see who wins the round?	Absolutely! I love this idea because the students like the suspense and it adds a layer of comparing numbers.
Can you share a list of strategies with us?	Think of the strategies in terms of layers. Addition Fact Fluency Layer 1: Foundational Facts +/- 0,1,2- Considered Counting Strategies Near Doubles, Combos of 10, 10+ Many of these strategies are learned through visual reinforcement using quick flashes, ten frames, fingers and building teen numbers. Layer 2: Derived Fact Strategies Near Doubles (Think Doubles +/-) Making Ten (Decomposing Numbers) Pretend a Ten (Compensation)

	Multiplication Fact Fluency Layer 1: Foundational Facts 2s,10s, 5s- Choral Counting Activities 1s, 0s, Squares (Visual Supports) Layer 2: Derived Fact Strategies Doubling (4s, 6s, 8s) Adding a Group (Use 1s, 2s and 5s to determine 3s and 6s) Subtracting a Group (Use 1s, 5s and 10s to determine 9s and 4s) Beak Apart (Distributive Property) Near Squares(Use squares to add or subtract a group)
What are your thoughts about a standards based report card that measure fluency - Students can add fluently to 20.	I would recommend changing the word from fluency to automaticity. Unless, you are assessing student flexibility and strategies as part of the process.
Should students be assessed by groups or strategies?	Unfortunately, if you do not say we are assessing them students and parents do not feel they are important. SO yes.
Any recommendations for third graders that still use their fingers?	Kids count when they do not have another strategy. You may want to say, "I saw you counted, do we have another strategy that we could use?" Use a ten frame or structures for a specific strategy. Ask, "How many do you see?" The strategy development will take longer at first but then we can generalize it later on. Only help for students who count is to make sense of the 10 strategies and practice the strategies. The brainingcamp app is a great visual tool for this.
Fluency Rubric	Attached Here
I am stuck on 395 + 784 = 381 + 800	This was a typo 😊 Please see video explanations here.
What strategies are recommended for mastery at each grade level K-4?	Counting strategies are typically taught first. We then move through the foundational strategies building off what student already know. You may have a younger and older student at the same level because the amount of exposure, modeling and practice that has been done. I have seen K students using the doubles +1 strategy effectively because of the environment they learned it.

	The combination of visual support and practice built the automaticity.
Is CPA method a good strategy?	I see the CPA method as an approach to teaching in general rather than a specific strategy used to learn math facts. The CPA method is used to learn the strategies. See the textbook example here.
Do you flash those subitizing numbers in all grades or only early ones?	Subitizing and quick flashes are used throughout all grade levels. Be intentional to the number string or picture string you use rather than randomly pulling picture cards. What connection are you trying to make?
Do you value counting over subitizing?	You may want to look up perceptual versus conceptual subitizing. There are some sets of objects we just look at and see. There are other combinations when we see smaller sets that we put together. See this short video I put together to explain. We are building the pictorial support for decomposing numbers. Perhaps we move the picture to a number bond and then to symbolic representation.
Can you explain the difference between pretend a ten and make a ten?	Please see the attached videos. Addition Reasoning Strategies Using 10 Make 10 Versus Pretend a 10
How much time would you spend on multiplication facts?	As much time as students need. You may consider the way your textbook lays it out and if it is in line with research? You may pause between lessons to practice a set before moving on. For example, if we do not know multiplication by 5 without counting, using 5 to determine x6 or x7 is not helpful. Pause and practice facts daily making sure to follow the learning progression.
Would you make an assumption that if students knew 10 facts that they would be able to answer a word problem with __+4 = 10.	Students who are fluent in make a 10 should be given many different representations to practice. They may start with ten frames in asking, how many more to make 10? Playing games like go fish for 10. They may then move to number bonds or numerals and symbols. Lastly, they will look at equivalent equations like these shown here when practicing making nines.