Speed Skills for Foundations Classes at LMAP

Rationale for Educators:

Students traditionally struggle in mathematics NOT due to a lack of skill or ability to learn new concepts, but due to weak number sense skills and a lack of mathematical automaticity. Consistent, perceived failure in math and struggling to recall basic facts often causes students to perpetuate feelings of failure and math anxiety.

Speed skills are designed to help students grow in their computational skills, their sense of self-worth, and perceived ability to learn. Mark P. Tully created *Speed Skills Challenge: Foundational Fluency Program for Middle School Math*. Tully identified 16 crucial skills to be strengthened through the use of speed skills with a "goal with this program is to build fluency and automaticity within our students that will be foundational to their success in middle school math." Here are some highlights of the Speed Skills Program from Tully:

- Just as a person who is fluent in a foreign language doesn't have to search for their words, a student fluent in the foundational mathematical skills will be able to **confidently approach mathematics** without being tripped up by the basic skills required to succeed in middle school math.
- Both **speed and accuracy** are important in cementing mathematical concepts into memory. Each student has the opportunity each day to improve their speed and accuracy.
- Personal progress statistics and personal line graph clearly show students the improvement and learning that has taken place for them individually during each module.

After using Tully's program in my practice and witnessing the direct impact on student performance and perception, I believe this program will have a significant impact on our students. To ensure the maximum amount of growth in skills and mindset for our students as well as utilizing delivery through Foundations classes, I will be creating and modifying components of the program to best support our unique community.

Prepared by Robin Richards

Understanding the BIG Picture of Using Speed Skills

Time:

- The first time that you complete a Speed Skill Challenge, it will take a little longer since students will not be familiar with the processes involved.
- However, once your students have experienced Speed Skills, the challenges should take no more than 10 minutes at the very beginning of your class.
- One Speed Skill topic will be covered over the course of 5 consecutive class periods.
- The fifth class period (or Speed Skill 5) will conclude with an analysis of Personal Progress.
- It will take a little longer the first time that you review the Personal Progress Stats and the Personal Line Graph with the students.

Administration of Speed Skills:

- There will be two pieces of paper used for each Speed Skill.
- The first four day's worth of Speed Skills will be printed on one paper, double-sided. Students should fold the paper to only view the Speed Skill that they are working on that day.
- The second sheet (not handed out until the final day) will have Speed Skill 5 and Personal Progress Stats on the front and each student's personal progress line graph on the back.
- Use a website like www.Online-Stopwatch.com to set up a clock that counts **UP** from zero, and project it on your SmartBoard.
- Have students record their finishing time in seconds when they complete each Speed Skill. (Each Speed Skill will have a 'cut-off' time, which students should record [in seconds] if they do not finish beforehand.) The time limit will be consistent for each Speed Skill set of five days.
- Students will self-score each Speed Skill with teacher guidance. Accurate reporting is essential for celebration of progress in both accuracy and speed.
- It is strongly encouraged to have students keep a portfolio of their work to be able to reflect on growth and share celebrations with families.

Prepared by Robin Richards

TEACHER TIPS

The following teacher tips are based upon my experience using Speed Skills in the classroom. Please modify these suggestions as needed to fit your students and your own teaching preferences. Please share any modifications with me so I can continue to revise the program to best support the LMAP community.

Time:

I will have suggestion of time for each Speed Skill (ranging from 1 to 5 minutes), although with some classes you may want to alter that time based on your professional expertise of their learning needs. Please note that if you go too long, students may lose focus. Taking a timed Speed Skill yourself may help you to determine the correct time for your students. Even if students cannot finish in the time you select, they WILL get faster during the 5-day module. If you have advanced students, be careful not to give too much time. It is preferable if every student cannot finish the Speed Skills on Day 1. That way students can improve in two areas: the number complete and their personal time. Whatever time you select, it should remain constant for the entire 5 days. You do not want to change the time after the first day since this will invalidate the student personal data you calculate at the end of the module.

Visual Timer for Students:

Students need to be able to easily see the time to record their individual time at the conclusion of each Speed Skill. www.online-stopwatch.com allows you to select a full screed digital timer that will count up or down. On Speed Skills you want to count up from zero and then say "stop" when the timer reaches your selected time period of two or three minutes. Most students are motivated by the opportunity to increase their speed as well as their number correct.

Correcting Speed Skills:

At the conclusion of the allocated time, I suggest reading off the correct answers for the students to self-correct in another color. Students put a line through any answer that is incorrect and write the correct answer. I also require students to copy any unfinished answers onto their papers. This engages students in the process, shows them the correct answers, and enables them to use the completed Speed Skill to practice.

Copies of Speed Skills:

I will create and make copies of Speed Skills to allow for use during every time that Foundations classes meet (beginning 9/9/13 through the end of the school year if we deem effective). As this will be a continuous process, I will get new copies of Speed Skills to teachers at a minimum of two school days before they may be administered.

Skipping:

Some students will wander through the 50 problems looking for the simpler problems to answer first. The danger here is that they will continually spend their time filling in the answers that they already know and not improving their skill by adding new skill fluency. As the teacher, you may want to set a policy of not allowing "skipping" if you see this becoming a widespread habit. At the very least, please explain the benefit of challenging themselves to answer questions in consecutive order to increase their math skill fluency.

Encourage Personal Growth over Comparing Themselves to Others:

Encourage students to continue to practice to that they can answer more problems correctly in less time. Each day after our Speed Skill, I would call on volunteers to share out their progress since the previous day. After Day 5 students will all use a self-analysis to compare their progress since Day 1. They will calculate their Percent Change and their Unit Rate (where they determine their increase in speed). Rather than worrying about "winning," encourage students to improve their own personal scores.

Hide Previous Speed Skills from View:

Before students begin Speed Skills 2 and 4, make sure that they fold their papers to 'hide' the previous Speed Skills. This avoids students referring back to the previous Speed Skill's answers rather than trying to calculate the answers.

Student Recognition:

In certain classroom situations competition can be rewarding and fun for the students. You may decide to create a "leader board" or to fill out a "Certificate of Recognition" for individual students. This component is completely up to your grade-level team and your assessment of your advisory's needs.

How to Account for Absences:

This is a challenge. I have instructed students that are absent to time themselves during another 'work time' activity (possibly during Advisory) with an individual stopwatch. I then give that student the answer key to self-correct. The Personal Progress Stats are not easily calculated without having 5 scores for each module. If a student was absent for Day 5 and the Progress Monitoring, I would assign the Progress Monitoring as homework as that was the component that I used to 'grade' the students.

Accountability/Grading:

For our professional accountability and analysis of effectiveness, I am requesting that teachers record each student's mean, percent increase, and speed increase (in seconds) for each module. Students will be individually calculating these values, therefore teachers will only need to record three values over each 5 days of Speed Skills during Foundations. To grade students, I recommend developing a grade-level norm. I have only graded based off of completion. If students were not accurate in a computation, I worked with them to correct the area and focused on the importance of the process over the importance of earning points. We want to focus as educators on identifying students (at a glance) who are falling behind in their foundational skills and how their scores compare to the rest of the class. Any students that you identify as being concerning, please notify Robin Richards (math coach) and the student's math teacher so we can begin interventions for support.

Speed Skill Instruction:

Other than briefly clarifying the type of problem, DO NOT offer any instruction before administering Speed Skills Day 1. You want this to serve as a baseline that identifies students initial skill level. Additional instruction/conversation after Day 1 is completed, that would benefit the students, is highly encouraged. We want these Speed Skills to become automatic in the minds of our students. If there are concepts that you can teach the students that will help them understand the given Speed Skill better, take the time to do this. Some Speed Skills require very little teaching and will instead require some time spent by the students to increase their speed and fluency.

Writing Utensils:

I suggest having the students complete the Speed Skill in pencil and then correct in a colored ink. In this way, it is easy to identify how each student is performing and to hold them accountable.

The Teacher's Role:

Your main role is to create a classroom atmosphere where the Speed Skill Challenge is fun and exciting and growth is celebrated above all! If you do this, you will help support your student's ability in not only math, but in perseverance and developing a growth-mindset. Challenge your students to better their previous scores and times, encourage them to practice at home and give them tips to improve their performance (as often as possible, this will be included in the packet that I give you for each module). Show your enthusiasm and it WILL be infectious and beneficial for our community!

Amazing Growth:

You will be amazed at the growth that students can make in 5 days to cement some key mathematical concepts into their minds. It is strongly encouraged to participate with your students! You may be amazed at how rewarding it can feel to experience mathematical success yourself and modeling helps to immediately create a culture of continuous growth and perseverance. Additionally, I have found that when I complete the Speed Skills myself, I am better able to give strategies (or in many cases LEARN strategies from the students) to help improve performance.

Tentative Timeline to Begin Our Work:

Here is a tentative timeline to begin our Speed Skill work and get us through the first quarter. We may modify as needed to support the expectations and delivery of the Foundations classes based on teacher reflection and feedback.

- 9/9 – 9/20 Adding Single-Digit Whole #'s
- 9/23 – 10/4 Adding Multi-Digit Whole #'s
- 10/7 – 10/22 Subtracting Single-Digit Whole #'s
- 10/23 – 11/6 Subtracting Multi-Digit Whole #'s