



Columbus Regional Math Collaborative April 30, 2021

Notes to Nerds

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Workshops

MON	TUE	WED	THU	FRI	MON	TUE	WED	THU	FRI
3	4	5	6	7	10	11	12	13	14
	 								

 Aiming for Deeper Understanding (K-1st) Tuesday, May 4th @ 3:45pm - 4:30pm	 Thinking Classrooms Book Study Tuesday, May 11th @ 7:30pm - 8:30pm
 Thinking Classrooms Book Study Tuesday, May 4th @ 7:30pm - 8:30pm	<i>We will be taking a summer break from our workshops. Stay tuned for next school year's schedule!</i>

THIS WEEK'S
TOP STORIES & INFORMATION

Announcements

- **Keep Getting Better** - Hope Phillips has been chosen to present at the SREB *Making Schools Work* conference this summer!
- **Showering of Workshops in April** - The Mathematics Collaborative presented more than 15 workshops this month. We provided three face-to-face workshops at our partner schools.



- **Operation Super Solver Camp!** - We are excited to offer this camp for rising 6th graders. We are accepting applications now! [Register Here](#)
 - Follow this link [Making Meaning](#) to CSU professor **Dr. Cindy Ticknor's** blog post with interesting ideas about what fractions are
- **Building Thinking Classrooms** book study is still open! We meet on Tuesdays at 7:30 pm. Join us! It will disrupt your current thinking about teaching (and fill you with new ideas!). Interested? Contact [Peter Anderson](#)



- **Parents' Resource Page** has some pretty cool MATH stuff! Check it out! ([Link to cool Parent stuff](#)) **TEACHERS** might like it **TWO... too!** 

Director's Notes

[I do I do I do....](#) (**Warning:** If you click on this link, you will hear a heartwarming, toe-tapping tune from the Broadway musical *Hamilton*.)

Eliza Skyler begins singing: *Oooh. I do, I do, I do, I do*, as she falls helplessly in love with Alexander Hamilton. I am lucky to know the feeling of falling in love. This song tickles those memories.

BUT what does that have to do with...*ahem*...math?

Two refrains -- *I do*, and *I am helpless*.

We have this mantra in mathematics education: **I do, we do, you do**. The teacher works a problem (*I do*). The class then tries a similar problem guided by the teacher (*We do*.) Then, miraculously, students can do an almost identical problem on their own (*You do*.) Notice something curious here... the focus is from the teacher's perspective of control. Shouldn't our focus be on *students'* perspective? This teaching strategy, though well-intentioned, has led to the death of thinking in the mathematics classroom. Students wait to be prompted. They are rewarded for mimicking and not for creating. Students are acted on, not encouraged to act on their own.

I prefer the first lyrics of the show tune *I do, I do, I do, I do*. But imagine if a student sang these lyrics. I do (the mathematics). I do (the thinking). I do (the problem-solving). I do (my work because I am engaged). The student becomes the actor. He is the creator. She is the risk-taker. The teacher takes on a new role, more of a mentor who sets the stage for learning and allows the drama to unwind. The teacher is the director, allowing mistakes but also allowing space for students to correct their thinking.

Later in the song, Eliza sings, "*I am helpless*." The refrain replies, "*But what you gonna do, girl?*" Imagine what a math class would look like if a student were to become *helpless*, stuck for a moment, and her heart's reply was, "*But what you gonna do, girl?*" I think we would call this resilience or the less elegant term **grit!**

The old TV show *High School Musical* allowed us to reimagine the classroom with music. What if we could imagine a classroom that allowed students to think about math and get excited to solve challenges? Students have always been ready to sing *I do, I do, I do, I do*. What are we as educators doing to facilitate this joy for learning?

I know. My head is in the clouds, but my feet are on the ground preparing to get there. We can do this! Have you listened to the song yet?

It has been a long year and a half. We know in our hearts things have to change. Take the time to dream about what can be. You might make the world a better place. If you are a teacher, you are already working hard at it. Why not work happily towards a better place?

Happy Maths,

Pete

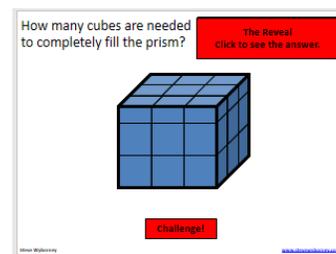
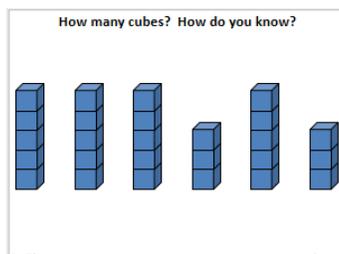
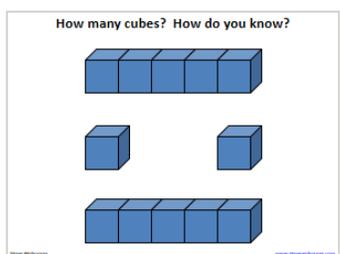
Resource Teacher's Notes by Laura Stokes

Meet Steve Wyborney: My Math Husband

Some people say Friday the 13th is an unlucky day. However, if Friday, November 13th, 2020 was the day you discovered Steve Wyborney, it may have been one of your luckiest days of this UNIQUE school year. That day was one of many that had a new resource from Steve Wyborney. Starting November 1st, Steve Wyborney had committed to post, daily, a new resource for the remainder of the school year. And he would share these resources, like all of his others, for FREE. What dedication . . . what a gift . . . what a man.

The first set of these resources can be found [here](#). If you scroll down to Friday, November 13th, you find a PowerPoint, "How Many Cubes and How Do You Know?" Like much of Wyborney's work there are multiple levels within a single resource, allowing teachers to select the appropriate slides for their students. For example, this PowerPoint (or google slide deck) provides an opportunity for students to count and/or subitize cubes, to group cubes to help find the total, and to determine the volume of a rectangular prism (using both whole and fractional units).

(Images below snipped from Nov. 13th resource: How Many Cubes and How Do You Know?)



Another focus of Steve Wyborney is estimation. Estimation is a skill that needs to be developed and practiced. Wyborney has two great sources for that: Estimation Clipboard and Esti-Mysteries. The beauty of Steve Wyborney's work is in how he reveals the needed information to the students. He builds their number sense as they think through the scenarios.

In Estimation Clipboard, students see a container with objects, and they are asked to estimate the number of objects. Once the actual count is revealed students see three other pictures – all with the same container and objects, but the container is filled to different levels. Students use the previous information to determine their new estimates. In each set of four pictures, the first two pictures are meant to be a quick reveal. This allows for a discussion about how well their estimates matched the actual value and what strategies they could use to make these two values approach each other. The next two pictures are revealed at a slower pace, giving students time to think through and record their estimate. The discussion that follows focuses on HOW students come up with their estimated value. For teachers new to this resource,

Wyborney has created a [short youtube video](#) describing the process (starts at 0:42). He also includes teacher tips within the PowerPoint.

- Tips for Using The Estimation Clipboard
1. When the **first image** (of 4) appears, invite the class to share some estimates aloud. Typically, a few students will offer some estimates. Don't spend much time on the first image. After you have received a few responses, reveal the answer.
 2. Make a mental note: if you hear answers from a small number of students, you are also hearing silence from nearly all of your class. Anticipate engaging all students in mathematical reasoning by the time you reach the third image.
 3. When the **second image** appears, invite the class to share some estimates aloud again. You will likely hear estimates from more students than the first time. You may want to spend a little more time on the second image, but the power of The Estimation Clipboard is yet to come.
 4. When the **third image** appears, change your approach. Remember, you haven't heard from several students at this point, but everyone's context is growing. When you show the third image, instead of asking for answers aloud **have all of the students write down their estimate**. Then have them discuss these two questions with a partner: "What was your estimate? Why did you choose it?" Listen carefully to the reasoning. **Certainly** this may be formatted very differently in distance learning.
 5. When the moment is right, reveal the third answer. Notice how your students are becoming increasingly engaged in the estimation process. That's partly because you are re-inviting them into a growing context. It's also because they have engaged in writing and discussion. The moment of writing has become a springboard for discussion. They have been given space to voice their ideas, and they are learning more about their ideas as they discuss them.
 6. When the **fourth image** appears, repeat the process from the previous step. Everyone in the classroom writes down their estimate, and then everyone tells their partner what estimate they chose and why they chose it. Expect the conversation to take a little longer here and notice that the conversations about the estimates – and about estimation itself – are becoming more detailed. You may see several students pointing to the screen during their discussions.
 7. When you reveal the final answer, listen to your class. Simply listen. Just take a moment to notice.
 8. As a learner yourself, engage in the process. Be a wonderer in front of your students. If you want a good question to wonder about, begin with this one: "What is estimation?"
 9. Enjoy the journey and feel free to share your learning experiences with others! You can find me on Twitter @stevewyborney

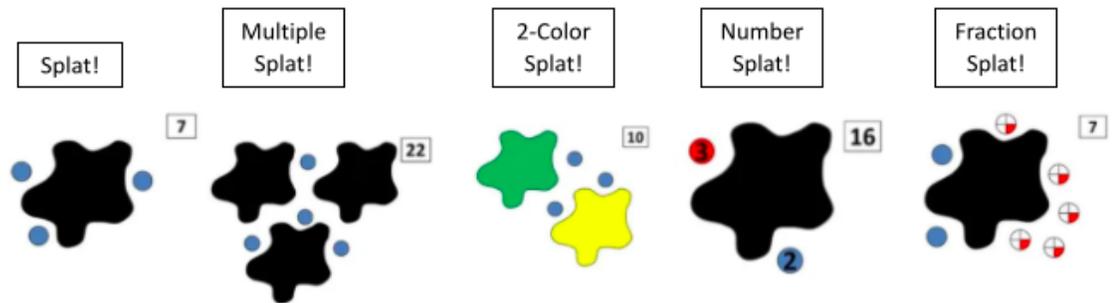


Esti-Mysteries also give students an opportunity to estimate the number of objects in a container. For this routine, students are progressively given clues to narrow their estimate to a reasonable, actual number. Clues may ask students to use their understanding of less than and greater than, odd/even, digits in a particular place value, etc. to narrow their estimate. Wyborney has added an interactive hundreds chart to the powerpoint to help students participate virtually ([youtube video on esti-mysteries with imbedded charts](#)). The beauty of this routine comes when students see the changes they make in their estimates as each clue is revealed. They need each clue to help narrow their estimate. They also need to make sure that their "prediction" fits not ONLY the current clue, but all previously revealed clues. Esti-Mysteries have evolved over the years. Initially, if the clues were correctly followed, there was only one value that fit all of the clues. Wyborney's more recent esti-mysteries allow for a few possible answers and the students then select the answer they feel is most reasonable. I think BOTH of these scenarios offer wonderful learning opportunities for students. The earlier esti-mysteries can be found [here](#).

If you have attended any training sessions with me over the last five years, there is a REALLY good chance that I have shared Splat! with you. The multiple versions of this routine develop part/part/whole relationships, multiplication understanding, adding/subtracting fractions with like denominators, and the understanding of constants and variables. They can be used at any level, from kindergarten classes to high schools sharing foundations of algebra.

The premise behind Splat! is that students are shown a visual image (dots, number discs, fractional parts) and they determine that quantity. Then part of it is covered by one or more SPLATS. Students then need to figure out the value under the splat(s). The discussions that come out of this activity are dynamic in developing students number sense. It is important to use this opportunity to shift students' counting by ones to efficiently finding the value by unitizing or subitizing. To find the multitude of Splats! go to: [Splat!](#) and [Fraction Splat!](#) and find

the sets that best fit your students' abilities.

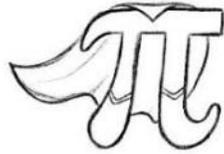


I could go on and on about Steve Wyborney and the materials he has created for teachers. In fact, I remember, one day about four years ago, I was describing the multitude of resources and ideas that this man has on his site, and a principal teasingly said, "I think you are in love with him!" I quickly answered, "I am. He is my math husband." His resources are strong mathematically, ask students to think about math in many different ways, AND they are FREE. What's not to love about that? I hope that I have that I have piqued your interest to look at Steve Wyborney's resources.

Links to other resources are:

- [Tiled area questions](#) combines the skill of determining area and understanding fractional values based on a given unit.
- [Cube Conversations](#) – students struggle with seeing the three-dimensional figure in a two-dimensional image. These help with that. I have had students build the image with snap cubes.
- [Dot Patterns](#) – Subitizing cards – dot images are a wonderful number sense routine.
- [The Maze Hundreds Chart](#) – takes the hundreds chart and makes it interactive (watch his video for a good explanation on how to use this resource)
- New Esti-Mysteries and Number Sense Resources Every Day for the Rest of the School Year –
 - [Part 1: Nov. 1, 2020 – Jan. 8, 2021.](#)
 - [Part 2: Jan. 10, 2021 – Mar. 5, 2021](#)
 - [Part 3: Mar. 8, 2021 – Apr. 16, 2021](#)
 - [Part 4: Apr. 19, 2021 – May 28, 2021 \(projected end date\)](#)

READ MORE ON OUR
WEBSITE



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