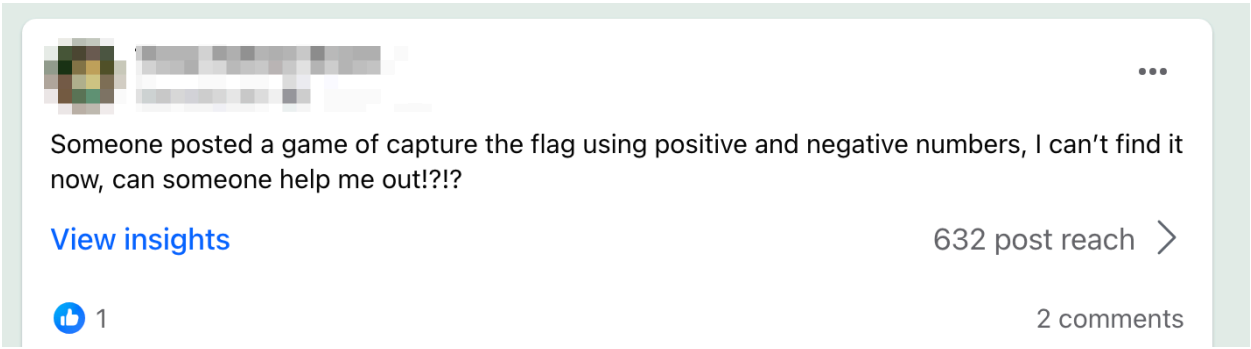
Welcome fellow Recovering Traditionalists to Episode 165: Geometry in PreK-2 is more than just knowing names of shapes

Before we get into the episode, this week's positivity comes from the Build Math Minds Facebook group again. It is a place to ask questions about the teaching and learning of math and to ask advice for activities to get your students engaged with mathematics. I loved seeing this post by Tresa because she had a specific activity she had heard about but couldn't find it so she asked the group and got her answer:



If you aren't a part of the Build Math Minds Facebook group you can join by going to https://www.facebook.com/groups/BuildMathMinds it's a great place to crowdsource your questions about teaching math.

Spring time is often the time of year that we turn towards Geometry concepts. I feel like it's often left until the end of the year just in case we run out of time… Geometry concepts are often seen as less important than other math concepts but they help lay a foundation of spatial reasoning that helps students as they progress through. My #1 recommendation for helping students build their understanding of Geometry is to be working on it throughout the year. I'll link to another video of mine that has my Top 3 Tips when it comes to Understanding Measurement and Geometry for Elementary Students. But since we are at the end of the school year, if you haven't spent much time on Geometry I'm going to share one of the big ideas in PreK-2 to be working with your students. This comes from the Navigating book series from the National Council of Teachers of Mathematics. From my research NCTM no longer has this series on their website to purchase but if you dig on Amazon you can find them. There's Navigating Through Algebra, Navigating Through Measurement, Navigating Through Number & Operations, and even more topics. These came out in the early 2000's, my Geometry one has a copyright of 2001, which was my second year of teaching. I loved these books and still continue to find them useful because of the way they are written. The authors laid out some big ideas in the teaching & learning of the particular math concept and then gave detailed activities you can do with your students to help them build those big ideas. I just really enjoy the format of these books and if you can get your hands on them, I highly recommend them.

So let's take a look at what Navigating Through Geometry in Prekindergarten-Grade 2 has to say about one of the big ideas in Geometry. There are 4 big ideas they address in this book:

Chapter 2 is about Location & Position
Chapter 3 is about Transformations & Symmetry
Chapter 4 is about Visualization, Spatial Reasoning, and Modeling

And Chapter 1 is about Two- and Three-Dimensional Shapes and is what I'd like to talk about in this episode.

When we think about Geometry in the early elementary grades the number one thing that comes to mind is Shapes. But what do young kids need to develop about shapes? On pages 2-3, they write:

"**Analyzing characteristics and properties of shapes**
By the time the youngest children begin formal schooling, they have already formed many concepts of shape, although their understanding is largely at the level of recognizing shapes by their general appearance and they frequently describe shapes in terms of familiar objects such as a box or a ball. In the primary grades, children should have ample opportunities to refine and focus their understanding and to gradually develop a mathematical vocabulary. They also should learn to recognize and name the parts of two- and three-dimensional shapes, such as the sides and the "corners," or vertices. Teachers should provide frequent hands-on experiences with materials, including technology, that help the students focus on attributes of various shapes, such as that a square is a special rectangle with all four sides the same length or that pyramids always have triangular faces that meet at a common point. Experiences that promote such outcomes include building and drawing shapes; comparing shapes and describing how they are alike and how they are different; sorting shapes according to one or more attributes; cutting or separating shapes into component parts and reassembling the parts to form the original or different shapes; and identifying shapes found in everyday objects or in the classroom, home, or neighborhood. Throughout such activities, teachers must take care to ensure that the children encounter both examples and nonexamples of common shapes and that they see those examples in many different contexts and orientations so that they learn to identify a triangle or a rectangle, for example, no matter what material it is made of or how it is positioned in space."

I want to restate this part so that you focus on the types of experiences…and let me just say that I love they were using the term EXPERIENCES back in the early 2000s, I like to say experiences as well instead of lesson or activity because we want kids experiencing math…and now I'm wondering if that's were I got the term from?? Okay again, here's the types of experiences they say the kids should be having around Two- and Three-Dimensional Shapes and I want you to compare that to what your textbook is having kids in PreK-2nd do and if you aren't doing some of these things see if you can add them in:

"...Experiences that promote such outcomes include building and drawing shapes; comparing shapes and describing how they are alike and how they are different; sorting shapes according to one or more attributes; cutting or separating shapes into component parts and reassembling the parts to form the original or different shapes; and identifying shapes found in everyday objects or in the classroom, home, or neighborhood. Throughout such activities, teachers must take care to ensure that the children encounter both examples and nonexamples of common shapes…"

All of these are important experiences to do with your students but you need to be careful that you aren't always using the same example for a certain shape and that's where the last type of experience can be helpful. Making

sure you are exposing students to examples and nonexamples of the common shapes. When we over use the same example for one shape, students start to think that is the only example of that shape. I don't remember where I saw it, but I remember learning how young kids are typically only shown an Equilateral Triangle as the example for a triangle in the early grades and so when they were shown an Obtuse Triangle like this they said it was NOT a triangle but when they were shown an image like this (for those of you just listening via the podcast, it's a drawing of a shape that looks like an equilateral triangle but the top doesn't connect) the kids said that IS a triangle. But it's only because it looks like the shape they always see for a triangle. So by doing experiences with your students that they need to look at examples and nonexamples, it forces them to pay attention to the characteristics and properties of shapes, to help students get beyond just naming those shapes in the early grades.

Until next week my Fellow Recovering Traditionalists, keep Building Math Minds.

This episode is brought to you by the Build Math Minds professional development site. It's an online site full of PD videos designed specifically for elementary teachers to help you build your math mind so you can build the math minds of your students. If you are interested in getting in-depth Math PD at Your Fingertips, become a member of Build Math Minds. Just go to buildmathminds.com/bmm and depending upon when you are listening to this, enrollment might be open or you can join the waitlist and get notified when it opens again.