### Project Idea Prompts II: Ideas Still Emerging!

#### By Noelle

\*all names and identifiers have been masked/changed to retain anonymity

# Prompt 1: What mathematics idea(s) or topic(s) are you considering for your manipulative? Why?

After my interview with Salih, who is in 5<sup>th</sup> grade, he stated that he was struggling with ordering decimals. Ordering decimals requires understanding of place value. I want to see how much he understood the place value on the right side of the decimal point. I found a few illustrated math tasks online that will help me understand his knowledge on decimals. I decided to create a manipulative on base ten decimal system. There are many different methods to reinforce understanding of decimals and place value such as using a number line, drawing diagrams, or using base ten blocks.

Prompt 2: Do you have an idea in mind for a tool or design? Please share. If you have drawings or scrap paper, or if you tried anything on Tinkercad, please include screenshots at the end of your paper (the page with screenshots does not count in the 2-3 page limit).

I was thinking that I might create a 3D number line to represent decimals in a meaningful way. I am undecided though. I started thinking about a box that can hold ones, tenths, hundredths so he can move them around, make comparison, and illustrate the decimals and explain the meaning of it. The problem I am having is both number line and 1000 cube already exist. In order my design to be genuine I was thinking I can add some kid friendly faces or little creatures in every unit. Since Salih was interested in Lego Ninjago I can create a snake or a dragon to relate to his interest. The snake can

have 10 little sections on it. Each part can represent one of the units that he chooses of either ones, tenths, hundredths or even thousandths. Or I can create a dragon with 10 fires coming out of its mouth. Each fire would represent a place value of his own choice.

# Prompt 3: What do you think makes for a "good" manipulative to support a child's learning? Why?

A good manipulative is a tool that helps the child to represent his/her thinking. The shape has to be easy to understand so no one gets confused by what it stands for. It can also represent different meanings. If your design is too complicated there is a possibility that students loose attention.

Manipulatives should be meaningful that children can relate to their interests. If a tool attracts attention of students it is likely that the students will be more engaged into the mathematical concept that is being taught. If you are actively engaged in a task you will probably remember the concept that you used manipulatives more than regularly taught topics.

The color choice is also important because colors have an impact on our thinking and perceptions. Our brain uses color to recognize patterns and memory.

Prompt 4: What do you think makes for a "good" manipulative to support a teacher's teaching? Why? (please consider how your answer to Prompt 3 compares/contrasts with your answer to this prompt)

A good manipulative should be simple for teacher as well as the students, so the teacher can understand and utilize the manipulative in the classroom. If it is complicated for teachers, then students will be more confused with the usage of it.

Learning takes place when students are actively engaged on the lesson. A good implementation of manipulatives can be key to make a lesson more engaging. They also help students to overcome math anxiety because concrete representations give another chance to grasp the idea if not understood by abstract explanations. A good manipulative attracts students' attention and gives a shot to those who show lack of interest in math.

Manipulatives make it easier to access mathematical concepts to all learners. For visual learners it is very crucial that they see what the abstract information stands for. Research indicates that using manipulatives is especially useful for teaching low achievers, students with learning disabilities, and English language learners (Marsh and Cooke, 1996; Ruzic and O'Connell, 2001).

Prompt 5: How are you feeling about this project right now (Overwhelmed? Excited? Cautious? Etc.). Please be honest. This too will help me help you either through emotional support or technical assistance, all of which we would be working through together!

I have a few ideas that I cannot decide which one would be more useful, original and creative. I am a little bit overwhelmed because I couldn't decide yet but also excited about this opportunity to be able to create my own math manipulative. I hope to finalize my design with your help.

### **Reference Citations**

Marsh, L. G. & Cooke, N. L. (1996). The effects of using manipulatives in teaching math problem solving to students with learning disabilities. Learning Disabilities Research & Practice, 11(1): 58–65.



