Infographic Comparing Cognitive Demand Tasks

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Create an infographic using Power Point, Canva, Adobe Spark, or another application that includes

- A comparison of high and low cognitive demand tasks.
- An explanation of how two or more of the *Standards for Mathematical Practice* could be fostered using a high cognitive task
- Include citations and references in your infographic.

	
Low Cognitive Demand Tasks	**High Cognitive Demand Tasks**
Completing a timed sheet of math facts.	Rolling 5 dice to play a game where students are required to make 10s before they count their dice.
Practicing multiplication flash cards.	Playing Factor, Factor, Product. Two students stand back to back on the whiteboard. Each writes a number 1-10 on the board. The third student shouts the product and the first student to figure out the other person's number remains at the board.
Asking students to solve a problem 831-416 using the standard algorithm.	Have students list as many ways they can to solve the problem and then discuss which are the most logical or effective.
Have students create a 12 square each day of their multiplications times table.	Ask students to develop a way to teach younger students multiplication facts.
Ask students to add a column of numbers totally $50.00.	Have students take a grocery flyer and plan a Thanksgiving dinner that cost less then $50 for their family.
Have students complete a set of problems adding and/or multiplying fractions.	Have students multiply a favorite family recipe to feed the entire school.

- An explanation of how two or more of the *Standards for Mathematical Practice* could be fostered using a high cognitive task

Mathematical Standard Number One states that students will make sense of problems and persevere in solving them. Last week I posed a problem to my students asking them if a new Playstation costs $559.99 and various accessories cost, $74.99, $54.99, 99.99, and $59.99. If they have saved $800 would that be enough to purchase them all?

Students were given the option to use play money, pencil and paper, white boards or any other method they chose to complete an answer. One of my students said, “isn’t $559.99 almost $560?” I was so excited he recognized that, but then he wasn’t sure what to do with the information. When he shared that information with the group the others found it interesting but most were so into multiplying 9s and adding up large columns of numbers they weren’t all that excited to change their answers.

We have 25 minutes to complete the task, and unfortunately time ran out before we could finish that day. I tried to gather everyone to see how if they rounded everything to the dollar amount they would be able to see right away $800 was enough for almost everything but they would have to put one thing back, but they were so involved in figuring it out, no one wanted to stop their own method. The student who chose play money and I were just about to discuss what would happen if they gave me $560 for the Playstation etc and I gave them a penny back instead

of him handing me 99¢ in change each time. We will have to finish next week. I call that perseverance.

Mathematical Standard Number three states students will be able to construct viable arguments and critique the reasoning of others. When I was teaching second grade to English Language Learners I created laminated prompts for mathematical discourse. Students wrote their answer, their partner's answer and if they agreed with them or not. If they did not agree they were prompted to explain why not. I found these were very valuable for students once they got the hang of using them and improved our conversations.

Perhaps I posed a question like 20 students rode the bus home. three got off at the first stop, four at the second stop and two at the third stop. How many students were still on the bus? Students would solve the problem by drawing a picture or using 10s frames. Some students who rode the bus would actually draw friends, others would use Xs and 0s to represent students, still others would put globs of play dough on two tens frames, and some would just write 3+4+2=9, 20-9=11. This is also an example of standard number four modeling with mathematics.

After completing their problem, they would write their answer on their prompt sheet, then ask their partner for their answer and finally explain why or why not they agreed with their partner. Then we would discuss the solutions whole group.

In the beginning, it was extremely challenging to get students to explain their answers especially since their writing skills at the beginning of the year were still very basic, but as the year went on students got the hang of using language and reasoning to express their mathematical ideas to one another.

In the fall of 2018, I was teaching a fourth grade class, where I posted math challenges in my parent Facebook group on the weekends. One of my **challenges** asked students to see if I met a goal of breaking 400,000 downloads on my organic gardening podcast. I had 79,872 on my first site and 320,513 on my current site. The question had two parts: A. Did I meet my goal? Did I break 400,000 and if so how do you know? B. Do you know by how many downloads? I find many students (and parents) don't like to be asked to read each night, but plenty are happy to complete a simple math task. Right before the pandemic I started hosting homework club in my room once a week during lunch. Students could eat in the room and play a game (usually Mousetrap.) Sometimes I think the mathematical discourse in my room is improved just talking about the homework due on Thursday for homework club.

References

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