



Summer Math

At DCA our mathematics teachers seek to promote thinking and the development of a student's conceptual understanding, procedural fluency, and mathematical reasoning and/or problem-solving skills. So often mathematics is seen as focused solely on the *correct* product obtained through *correctly* working the *correct* process. This type of thinking would align with reducing use of the English language to nothing more than spelling and rules of grammar. Just as we have the works of Shakespeare, Dante, and Donne to show the beauty and depth of language, we have the works of millenia of great mathematicians to show the beauty and depth of this discipline. With this in mind the DCA Mathematics Department asks that over the summer our students pursue application of conceptual understanding, reasoning through a lens of mathematics to find solutions to a variety of problem types, and continuation of work on procedural fluency.

Wondering how to best approach this summer mathematics challenge?

1. Ask questions!

What if...we did not have a 0? ..or we could only make right-hand turns outside the neighborhood? ...or you need to determine the volume of an irregularly shaped swimming pool?...or you are asked to find how many ways can you arrange a group of items you see into 2 well-defined categories? Now 3 categories? Now 4?....How do the category definitions change, and what remains the same?

2. *Look for solutions to everyday problems!*

How much should be budgeted for your vacation? How many rides can you reasonably expect to enjoy during a 12-hr day at Dollywood? How did you find this? What most impacted your answer? Is it exact or an approximation? Can you determine the rate your grass grows? Does it vary by month? By week? How many more wins does your team need to guarantee a winning season? How much does each additional win impact their winning percentage? Is it a fixed %? How much mulch will it take to upgrade your backyard? What would be the cost for this? Find 2-3 different places to purchase and determine the best overall price for the job. How long would it take you to apply the mulch? What if someone helps you? What if the person only helps once you are halfway finished? What if you just paid someone to complete the whole project? How would they determine the project price? What markup do you see on the mulch? What is the labor cost?

3. *Practice mathematical fluency!*

Should you still find a slope? Factor? Determine the altitude of a triangle? YES! Put pencil to paper on the class-level math work packets on our website. Pace yourself and work a few problems of each type each week. Stuck on how to start or want confirmation that you understand the question? There are excellent supplementary resources online. Khan Academy is a great resource to get you moving in the right direction (not an endorsement of KA's full site). Bring your completed packet to turn in the first day of school.

4. *Challenge yourself!*

Use your reasoning skills on a variety of fun and engaging questions. You can find some interesting math problems here: [EngagingMathematicalTasks](#)
Then....

Read for an extended period of time each week. Some good authors/titles: Lewis Carroll, J.R.R. Tolkien, C.S. Lewis, Dostoevsky, John Donne, *Flatland* and *Flatter Land*, *Gulliver's Travels*, *Robison Crusoe*, *Arabian Nights*, *The Scarlet Pimpernel*, *The Murder of Roger Ackroyd*, *The Man Who Was Thursday*, any good poetry from Tennyson to Wordsworth to Elliot to Frost to Dickinson to Poe...and beyond (in addition to appreciating the work itself, pause to notice rhyme and meter)

Enjoy music such as Bach's *The Art of Fugue*, Handel's Water Music, and current tunes, noticing melody, pitch, scales and all the other wonderful connections between mathematics and music.

Put away all digital devices- start with one hour each day and work toward navigating the majority of your waking hours without using any technology.

Take a walk and reflect, engage, and enjoy all the beauty in God's designs. Look for radial, bilateral, and rotational symmetry in flowers, patterns on a tortoise shell or snake skin, and tessellations and translations in the world of insects,...so much to appreciate.

Looking forward with great anticipation to your return to the classroom in August,

DCA MS-US Mathematics Department