



## Omnipresent and beautiful

The Telegram (St. John's)

Wed 18 Mar 2009

Page: B3

Section: Life & Times

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Source: Canwest News Service

Why do I need to learn math? This is a question that virtually every parent will be asked at some point during the nightly homework battle. And the worrisome thing is that most parents don't really know how to answer this. I remember when the father from the comic strip Calvin & Hobbes was asked this very question. His response: "Because it builds character."

As a mathematician, I could tell you a thousand really great reasons why math is important. I could tell you why math is amazing and beautiful! (Yes, I did just say math is beautiful.) But for those non-mathematician parents out there, how do you comfortably and truthfully answer this question?

I firmly believe that the key is to show children that math is everywhere in their world. And I mean everywhere.

Understanding numbers and how they work is necessary for our everyday life: when you go to the grocery store, make dinner, plan your monthly budget and dozens of other tasks. But it is beyond this basic arithmetic where the disconnect really occurs. Once a child has mastered addition, subtraction, multiplication and division, we, as parents, also need to know the reasons why math is so important.

The bottom line is that math is applicable to every field of human endeavour, activity and industry. From helping us to understand the impacts of climate change, to predicting the future of our economy, to developing the latest MP3 player or the coolest new video game, the element linking all of these is math. And the list does not stop there.

Mathematical models are used by the forest service and governments to help them figure out, before a fire starts, how the flames are most likely to spread.

The models look at different wind speeds, how close the area in question is to water and the type of surrounding terrain. In essence, the models paint a picture for firefighters so they can plan in advance the best way to attack a stubborn blaze.

In medicine, math helps scientists to understand how diseases such as diabetes, Alzheimer's and HIV work in cells and organs. Scientists have discovered that there are tens of thousands of genes in the human body which play a role in virtually every disease known today. Imagine trying to sort through all those genes to determine how one gene, or a combination of several genes, plays a role in someone developing a certain disease. Math is the master of data management. Math can help find patterns in seeming randomness and reveal information that scientists didn't know was there in the first place.

The overriding message here: math is in every part of your life. When children question why they need to learn math, they need to know that it is relevant for them. It is important to take it out of the abstract and into the everyday.

Math keeps planes in the air, makes credit card transactions secure and powers your Google search engine. And all of these innovations are built on a foundation that begins with the mastery of mathematical concepts from elementary school onward.

Of course, it may not be obvious how math contributes to all these things. But just as most of us don't know how to perform a heart transplant, we do understand that the basic knowledge about life (oxygen, food, water etc.), cell organization and the circulatory system that we learn in elementary school are the foundation for eventually becoming a cardiovascular surgeon.

We may have trouble visualizing a mathematical model but the process of learning what is necessary starts with the basics - and then we build from there.

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Illustration:

Idnumber: 200903180061

Length: 655 words

Tone: Positive 

Ad Value: \$1,026.63 

Circulation: 29,662 