HOW WE TEACH FUNCTIONS IN A LESS RESOURCED GRADE 10 CLASS

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INTRODUCTION

With specific reference to functions at Grade 10 level, the new CAPS document expects learners to work with variables in terms of numerical, graphical, verbal and symbolic representations of functions and convert flexibly between these representations (tables, graphs, words and formulae). While the learners are not restricted to working with linear functions, the expectation is that they will make sense of functions starting with linear relationships.

WHY FUNCTIONS?

Linear functions have been and will continue to be a fundamental part of the study of algebra as mathematics education develops to meet the needs of the ever-changing technological world of today. These functions help us to better understand the world around us, and to answer problems and explain phenomena from many diverse fields, including physics, biology, and economics. One of the major goals of mathematics education is developing good problem solving skills. Students need a solid understanding of multiple representations of various functions, including linear functions, in order to be considered mathematically literate. Teaching from this perspective, and making multiple opportunities available to help students make connections and develop these skills is very important in today's mathematics classroom.

SO WHAT ARE WE GOING TO DO DIFFERENTLY?

In the traditional approach to algebra, students generally learn how to solve linear equations before they study linear models. Traditionally, solving equations was devoid of any real-world context until after the symbol manipulations were mastered. However, some of the newer materials emphasize understanding the mathematical model as it is related to a real-world application and then building on that conceptual understanding in order to help students solve equations.

In this lesson, students work with linear situations involving tasks from a real-world context. Consistent with the CAPS document expectation, which states that "Mathematical problem solving enables us to understand the world around….", our view is that modelling functions from the real world contexts helps students understand the basic patterns involved in linear models and gives them a firm foundation for solving problems involving linear situations - in their symbolic form, graphic form, and table form. It also gives students more ways to solve these types of problems. They are not

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limited to using symbol manipulation. They can solve an equation using a graph or a table of values in addition to using symbol manipulation.

So in our presentation we are going to show how we taught linear functions in Grade 10 class from a previously disadvantaged community using tasks from the real world-context.

LESSON OBJECTIVES

By the end of this lesson, students will be able to:

1. Translate a verbal statement into a function/equation and then use the equation to explore the given problem
2. Identify the type of relationships between the quantities in the problems (linear)
3. Identify the independent and dependent variables, and then write linear equations of the form: .
4. Solve the problems algebraically
5. Take the algebraic representations and express these as tables and then draw graphs to show the different ways of arriving at the solutions.
6. Compare these different ways of representing the same information and discuss the advantages and disadvantages of using each one of them for solving similar problems. The aim is for the learners to see the connections they can make between the different representations.

WHAT KNOWLEDGE DID WE ASSUME OUR LEARNERS TO HAVE?

We assumed our learners to be able to work with relationships between variables using tables, graphs, words and formulae. Convert flexibly between these representations. At this level it is sufficient to investigate the way output values depend on how input values vary. The terms independent (input) and dependent (output) variables might be useful.

WHAT CONCEPTS DID WE WANT TO TEACH IN THIS LESSON?

1. Learners will identify the defining characteristics of a linear function.
2. Learners make connections between graphical and symbolic representations by examining and manipulating the three symbolic forms of a linear function in order to use such models for problem solving
3. Learners will gain deeper understanding of linear functions as they become more aware and motivated to observe and reflect on its application in a real-world environment

CONCLUSION

At the time of submitting this abstract, the lessons are still going on. So in the presentation we will then give a more detailed account of how the lessons went taking

note of where learners experienced some challenges and what we did about such challenges.

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