Lesson Plan Overview
Course: MHF4U (Mathematics Advanced Functions, Grade 12, University Preparation)
Unit D: Characteristics of Functions
Lesson Name: Lesson Plan 2.2 Estimating Instantaneous Rates of Change from Tables of Values and Equations
Date: Wednesday, 20 September 2017 (Day 2 Late Start, 12:45-13:40h)

Lesson Objectives

Students will learn to calculate and interpret the instantaneous rate of change at a particular value of the independent variable of a function. The function is expressed algebraically, or as a table of values.

Along with the definition of instantaneous rate of change, the various types of intervals (preceding, following, and centered) and the difference quotient will be discussed.

Overall Expectations:

D1. demonstrate an understanding of average and instantaneous rate of change, and determine, numerically and graphically, and interpret the average rate of change of a function over a given interval and the instantaneous rate of change of a function at a given point;

Specific Expectations:

D1.5 recognize examples of instantaneous rates of change arising from real-world situations, and make connections between instantaneous rates of change and average rates of change (e.g., an average rate of change can be used to approximate an instantaneous rate of change)

D1.6 determine, through investigation using various representations of relationships (e.g., **tables of values**, graphs, **equations**), approximate instantaneous rates of change arising from real-world applications (e.g., in the natural, physical, and social sciences) by using average rates of change and reducing the interval over which the average rate of change is determined

Summary of Tasks and Actions

Agenda on the chalkboard when students walk in
Lesson handouts at front table
Walk-In Question – Review from yesterday

- show the picture of the roller coaster at Cedar Point, with (x,y) axis superimposed
- what is the average rate of change of the roller coaster shown on this track?

12:45h: Class Start (5 min)

- Personal check-in
- Take attendance

12:50h: Formal Lesson

The lesson is delivered using the notes prepared in Notebook. Students participate in the lesson by completing a fill-in-the-blank notes worksheet. The key points of the lesson include:

- Review of average rate of change (5 min)
- Discussion: whether the AROC of a large interval of f(x) is suitable to estimate a smaller interval or single point (10 min)
- Definition of instantaneous rate of change (5 min)
- AROC estimated using points P, Q. Effects as Q → P. (10 min)
    - This portion of the lesson incorporates a pre-loaded demonstration in Desmos.
- Intervals to estimate AROC (10 min)
- Examples (time permitting, 10 min)
- Difference quotient – students are shown this equation, and as part of their homework are tasked with deriving it.

Homework:

- Derive the difference quotient for both a preceding interval, and a centered interval.
- Pg 86, #2-6, 9, 10

Class End at 13:40h

Homework Assignments / Reminders
• Homework as stated above • Quiz on Monday: Sections 2.1-2.3 in the textbook.

Preparation and Materials	
	notebook notes
	student notes worksheet
	try the homework

Post-Reflection and Self-Evaluation; Assessment of Student Learning