MYP unit planner

Teacher(s)		**Subject group and discipline**	**Mathematics (Standard)**		
Unit title	**Quadratics—The power of mathematics**	**MYP year**	**5**	**Unit duration (hrs)**	**20**

INQUIRY: Establishing the purpose of the unit

Key concept	**Related concept(s)**	**Global context**
Relationships	Model Representation	Globalization and sustainability: The impact of decision making on humankind and the environment
Statement of inquiry		
Using a model to represent a relationship can improve decision making		
Inquiry questions		
Factual How many zeros can a quadratic equation have? What are the conditions for a quadratic equation to have; no zeros, one zero, or two zeros? Conceptual How to find the equation of a parabola given two zeros and a point, or given the vertex and a point? Debatable What is the best method to find a quadratic model?		

Objectives:	Summative assessment	
A B C D	**Outline of summative assessment task(s) including assessment criteria:** Parabolic tunnel (C and D) Use GDC to investigate $f(ax)$ (B) Test (A)	**Relationship between summative assessment task(s) and statement of inquiry:** In the Parabolic tunnel task (C and D): • Students are expected to find the model of a tunnel and check whether a truck can pass through • Students are expected to find the model in the best way, depending on the givens in the problem • Students are expected to notice that the parabola is not the best shape for a tunnel and suggest alternative shapes In the investigation (B): • Students are expected to understand how the change of the parameter "a" in $f(ax)$ affects the representation of the parabola In the test (A): • Students are expected to use models of relationships, based on the theory covered in the unit, to decide on correct answers

Approaches to learning (ATL)
Thinking: Critical thinking skills—Draw reasonable conclusions and generalizations. Students are expected to be able to analyse the available data gathered to draw conclusions on when the parabolic model is a good model to use in real life. Research: Information literacy skills—Make connections between various sources of information. Through investigative research about different real-life monuments and buildings, students are expected to be able to select and use their findings on buildings that are only in the form of a parabola. Self-management: Reflection skills—Identify strengths and weaknesses of personal learning strategies (self-assessment): Students reflect after the test on their performance. Besides making a correction for the test, they will write a complete reflection including: weaknesses, strengths, what they did wrong in their preparation for the test, what they did right, and what they are planning to do for the next test to be able to perform better.

ACTION: Teaching and learning through inquiry

Content	**Learning process**
The quadratic function: - graphical representation (Graphing the quadratic function and understanding its characteristics) - domain and range (Determining the range given the domain) - transformations (Translation, reflection, and dilation) - Describing transformed quadratic equations Example $f(x) = a(x - h)^2 + k$ The quadratic equation: Solving quadratic equations algebraically and graphically	Learning experiences and teaching strategies Group-work activity where students find the quadratic function (with appropriate domain and range) of given parabolic graphs (**graphical representation**, **domain and range**) In pairs, students sketch quadratic functions, given their equation and domain (graphical representation, domain and range). (**translation**, **reflection and dilation**) In pairs, students use Geogebra creatively to plot a figure of their choice including lines and parabolas (**graphical representation**, **domain and range**) Mastery of learning by having practice classes on **solving quadratic equations algebraically and graphically** Students should be now ready to work on the summative assessment task
	Formative assessment Assessing the results students obtained in group-work activities Test that will conclude with self-assessment and then will be revised by the teacher Practice/take-home test that will conclude with peer assessment and then will be revised by the teacher
	Differentiation Homework varying in complexity and length During activities, some students may need support and feedback during the activity to ensure they are on the right track

Resources
Squared flip charts Permanent markers Computers where the Geogebra (graphing software), or similar, is installed

REFLECTION: Considering the planning, process and impact of the inquiry

Prior to teaching the unit	During teaching	After teaching the unit
	I realised that it is always better to start the teaching of any function using real-life variables (for example, time and distance or time and speed) instead of *x* and *y*.	I realised that I should have prepared the flip charts with the horizontal and vertical axes ready for students to make their graphs.