**Year Level:** 10 Pure Mathematics  
**Topic:** Quadratic Graphs  
**Time:** 4 Weeks

**Aim:** Investigating Parabolas and their features and how/where/why parabolas are used in the real world.

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| 1    | A suggested start to the topic could be looking at bridges and the suspension bridge activity and modelling its equation using GC. See Bridge Power point on N Drive. Discuss parabolas as a graph of a quadratic function. $y = ax^2 + bx + c$ | Using GC to model data. Use GC and G-SOLVE to identify important features of the parabola:  
- Turning point / Vertex  
- Axes intercepts  
- Axis of symmetry  
Use GC and TABLE to help students draw graphs. More Practice using Exercise 16C.1 | Bridge Photographs: [http://freefoto.com](http://freefoto.com)  
Using string, blue tack and whiteboard marker to shape a Bridge on a window to model a Parabola.  
Text Ex.16C.1 |  |
| 1    | Investigate Vertical & Horizontal Translation. Graphics Package for Invest.1,2,3 in Text show a good computer demo. |  
- The effect of “$k$” for $y = ax^2 + k$ and “$h$” for $y = (x-h)^2$.  
- Drawing $y = (x-h)^2 + k$ and identifying the vertex as $(h,k)$ | See Investigation 1 (P.330)  
Ex.16C.2 #1 - #4  
Ex.16C.2 #5, 6 |  |
| 2    | Investigating Dilation and convex / concave. Investigating Arch Bridges ($a < 0$). See Bridge power point on N Drive. | The effect of “$a$” and graphs of the form $y = ax^2$ | See Investigation 5 (P.386)  
Ex.16C.2 #10, 11  
Ex.16C.2 #12 - 14 | Trucks & Tunnels DI |
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| 2      | Finding axes intercepts using algebraic skills. | • Finding y-intercept (c) using \( x = 0 \)  
• Finding x-intercepts by letting \( y = 0 \) and solving quadratic equations. | Ex.16D.1  
Ex.16D.2  
Ex.16D.3 |           |
| 3      | Finding Axis of symmetry and vertex using algebraic method. | • Find axis of symmetry using \( x = \frac{-b}{2a} \)  
• Find vertex using \( x = \frac{-b}{2a} \) | Ex.16F  
The quadratic Graph and Parabolas Revision sheet.  
# 1, 2, 3, 5 |           |
Ex.16G  
The quadratic Graph and Parabolas Revision sheet.  
# 4 |           |
| 4      | Summary Revision and Test | NOTE: Completing the square is not part of the course. | Review Set A & B ( leave # 1, and # 5 can be done on GC with G-solve) | Skills Test on Parabolas and Quadratics. |