Quebec - Achievements and Competencies

Learning Outcomes

Math TS and S Options (Sec. 4-5)
Second-degree equations
Vectors

The Quebec Achievements and Competencies are based on the Progression of Learning Outcomes derived from the Quebec Education Plan set by the Ministere de l'Education, du Loisir et du Sport.

Specific Expectations

MATHEMATICS - Technical and Scientific Option

Secondary 5

ALGEBRA: Understanding dependency relationships

B. Analyzing situations using real functions
      b. second-degree polynomial functions
        iii) $f(x) = ax^2 + bx + c$, $f(x) = a(b(x - h))^2 + k$, $f(x) = a(x - x1)(x - x2)$
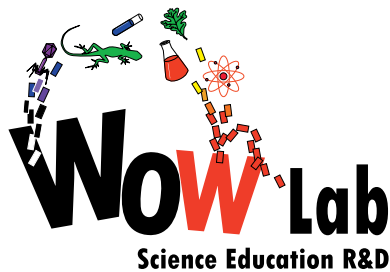
Students will observe that the projectiles follow a parabolic path while in flight. Students can use three points along the path to derive the second-degree function that describes the rocket's motion. In order to do this, students must use the quadratic function in either factor form or convert it to the general form.

GEOMETRY: Analyzing situations involving measurements

H. Vectors in the Cartesian or Euclidean plane
      6. Analyzes and models situations using vectors (e.g. displacements, forces, speeds or velocities)

Students may use vector calculations to discover the velocity, and the horizontal and vertical displacement of the rocket from each angle it was launched at.

MATHEMATICS - ***Science Option***

Secondary 5

ALGEBRA: Understanding dependency relationships

B. Analyzing situations using real functions
       b. second-degree polynomial functions
         iii) $f(x) = ax^2 + bx + c$, $f(x) = a(b(x - h))^2 + k$, $f(x) = a(x - x1)(x - x2)$

Students will observe that the projectiles follow a parabolic path while in flight. Students can use three points along the path to derive the second-degree function that describes the rocket's motion. In order to do this, students must use the quadratic function in either factor form or convert it to the general form.

ALGEBRA: Understanding and manipulating algebraic expressions

D. Analyzing a situation using systems of equations or inequalities
       3. Solves a system
         d. of second-degree equations in relation to conics using changing variables, if applicable

Because the projectile follows a parabolic path, students must understand that a second-degree function can describe the rocket's motion. Students can solve the model with respect to distance, or they can solve the model with respect to time.

GEOMETRY: Analyzing situations involving measurements

H. Vectors in the Cartesian or Euclidean plane
       6. Analyzes and models situations using vectors (e.g. displacements, forces, speeds or velocities)

Students may use vector calculations to discover the velocity, and the horizontal and vertical displacement of the rocket from each angle it was launched at.