

Course Profile

Foundations of Mathematics

Grade 9
Applied

• *for teachers by teachers*

Course Profiles are professional development materials designed to help teachers implement the new Grade 9 secondary school curriculum. These materials were created by writing partnerships of school boards and subject associations. The development of these resources was funded by the Ontario Ministry of Education and Training. This document reflects the views of the developers and not necessarily those of the Ministry. Permission is given to reproduce these materials for any purpose except profit. Teachers are also encouraged to amend, revise, edit, cut, paste, and otherwise adapt this material for educational purposes.

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Development Date: February/March 1999

Course Revisor(s):

Revision Date: March/April 1999.

Additional Codes:

Eastern Ontario Catholic Curriculum Cooperative

Institute for Catholic Education

Course Overview

Mathematics, Applied, Grade 9

Identifying Information:

| | |
|---|--|
| School: | Course Developer(s): Arlene Corrigan, Dominique Levac Maureen Vincentine, Linda Sloan, Carolyn Boyer, |
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| Course Title: Foundations of Mathematics | Paul Costa |
| Grade: 9 | Development Date: February/March 1999 |
| Course Type: Applied | Course Revisor(s): |
| Ministry Course Code: MFMIP | Revision Date: March/April 1999. |
| Credit Value: 1.0 | |

Description/Rationale

This course enables students to develop mathematical ideas and methods through the exploration of applications, the effective use of technology, and extended experiences with hands-on activities. Students will investigate relationships of straight lines in analytic geometry, solve problems involving the measurement of 3-dimensional objects and 2-dimensional figures, and apply key numeric and algebraic skills in problem solving. Students will also have opportunities to consolidate core skills and deepen their understanding of key mathematical concepts.

How This Course Supports the Ontario Catholic School Graduate Expectations

This course enables students to develop a confident and positive sense of self. Within the setting of a supportive and caring classroom community, the dignity and value of each student is respected and affirmed. Through their personal growth in reason, critical thinking and communication, students come to appreciate their mathematical ability as a God given gift. By sharing their abilities, students contribute to the good of others, in service to the classroom and school community.

Unit Titles (Time and Sequence)

| | | |
|--------|-------------------------------------|----------|
| Unit 1 | Exploring Relationships | 25 hours |
| Unit 2 | Modeling Linear Relationships | 35 hours |
| Unit 3 | Exploring Relationships in Geometry | 35 hours |
| Unit 4 | Making Connections | 15 hours |

Unit Organization - Mathematics, Applied, Grade 9

Unit #1: Exploring Relationships

Time: 25 Hours

Description:

In this unit, students and teachers will begin to explore both linear and non-linear relationships arising from meaningful problems. Students will develop numeric and graphic and skills as needed in the context of the activity. Various forms of assessment are built into all the activities.

Ontario Catholic School Graduation Expectations: CGE 3c, 4b, 5a, 7j

Strand(s): Number Sense and Algebra, Relationships

Overall Expectations: NAV.01, NAV.02, REV.01, REV.02, REV.03.

Specific Expectations: NA1.01, NA1.02, NA1.03, NA1.04, NA1.05, NA1.06, NA2.04, NA2.05, RE1.01, RE1.02, RE1.03, RE1.04, RE1.05, RE1.06, RE1.07, RE2.01, RE2.02, RE2.04, RE2.05, RE3.01, RE3.02, RE3.03, RE3.04.

Unit #2 : Modelling Linear Relationships

Time: 35 Hours

Description:

In this unit, students and teachers will explore numerical, graphical and algebraic models (tables, graphs, equations) of linear relationships arising from meaningful problems. Students will develop numeric, graphic and algebraic skills as needed. Various forms of assessment are built into all the activities.

Ontario Catholic School Graduate Expectations: CGE 2b, 3c, 3e, 4f, 5a, 5g

Strands: Number Sense and Algebra, Relationships, Analytic Geometry

Overall Expectations: NAV.01, NAV.02, NAV.03, NAV.04, REV.01, REV.02, REV.03, AGV.01, AGV.02, AGV.03,

Specific Expectations: NA1.01, NA1.02, NA1.03, NA1.04, NA1.05, NA1.06, NA2.04, NA2.05, NA3.01, NA3.02, NA3.03, NA3.05, NA4.01, NA4.02, NA4.03, RE1.01, RE1.02, RE1.03, RE1.04, RE1.05, RE1.06, RE1.07, RE2.01, RE2.02, RE2.03, RE3.01, RE3.02, RE3.04, AG1.01, AG1.02, AG1.03, AG2.01, AG2.02, AG2.03, AG2.04, AG3.01, AG3.02, AG3.03, AG3.04, AG3.05.

Unit #3: Exploring Relationships in Geometry

Time: 35 Hours

Description:

In this unit, students and teachers will explore and model relationships in measurement and geometry numerically and graphically in the context of optimization problems. This is an extension of the study of non-linear relationships introduced in Unit 1. Students will also explore geometric relationships using dynamic geometry software.

Ontario Catholic School Graduation Expectations: GE 2b, 5a, 5b

Strand: Number Sense and Algebra, Relationships, Analytic Geometry, Measurement and Geometry

Overall Expectations: NAV.02, NAV.03, REV.01, REV.02, REV.03, MG.01, MG.02, MG.03

Specific Expectations: NA2.01, NA2.02, NA2.03, NA2.04, NA2.05, NA2.06, NA3.01, NA3.02, NA3.03, NA3.04, NA3.05, NA3.06, RE1.01, RE1.02, RE1.03, RE1.04, RE1.05, RE1.06, RE1.07, RE2.01, RE2.04, RE3.02, RE3.03, RE3.04, AG3.01, MG1.01, MG1.02, MG1.03, MG1.04, MG2.01, MG2.02, MG2.03, MG2.04, MG2.05, MG3.01, MG3.02, MG3.03, MG3.04.

Unit #4: Making Connections

Time: 15 Hours

Description: In this unit, students will engage in a few, large assessment activities. These activities will capture the essence of the grade 9 course. One activity will serve as a culminating assessment task, which will be used in conjunction with a final exam as a final assessment.

Ontario Catholic School Graduation Expectations: CGE 2b, 5a, 5b.

Strand: Number Sense and Algebra, Relationships, Analytic Geometry, Measurement and Geometry

Overall Expectations: NAV.01, REV.01, REV.02, REV.03, AGV.01, AGV.02, AGV.03, MG.01, MG.02.

Specific Expectations: NA1.01, NA1.02, NA1.03, NA1.04, NA1.05, RE1.01, RE1.02, RE1.03, RE1.04, RE1.05, RE1.06, RE1.07, RE2.01, RE2.02, RE2.03, RE2.04, RE2.05, RE3.02, RE3.03, RE3.04, AG1.01, AG1.02, AG1.03, AG2.01, AG2.02, AG2.03, AG2.04, AG3.01, AG3.02, AG3.03, AG3.04, AG3.05, AG3.06, MG1.01, MG1.02, MG1.03, MG1.04, MG2.01, MG2.03, MG2.04, MG2.05.

Course Notes

“It is expected that in developing detailed courses of study from this document, teachers will weave together related expectations from different strands ...” (page 5, The Ontario Curriculum, Grades 9 and 10, Mathematics, 1999). This course profile has been constructed with a common theme of relationships that connects all the units. Below is a chart which displays the “weaving” we have done:

| Strand Unit | Number Sense and Algebra | Relationships | Analytic Geometry | Measurement and Geometry |
|---|-------------------------------------|----------------------|------------------------------|-------------------------------------|
| 1. Exploring Relationships | √ | √ | | |
| 2. Exploring Linear Relationships | √ | √ | √ | |
| 3. Exploring Relationships in Geometry | √ | √ | | √ |
| 4. Making Connections | √ | √ | √ | √ |

“Skill acquisition is an important part of the program: skills are embedded in the contexts offered by various topics in the mathematics program and should be introduced as they are needed.” (page 4, The Ontario Curriculum, Grades 9 and 10, Mathematics, 1999). We have endeavoured to ensure that skill development is truly embedded in the activities we have designed.

“The philosophy of the Grade 9 courses is consistent with that of the elementary program and facilitates a seamless transition from elementary school, because it reflects the belief that students learn mathematics effectively when they have initial opportunities to explore through hands-on experiences, followed by careful guidance into an understanding of the abstract mathematics involved.” (page 4, The Ontario Curriculum, Grades 9 and 10, Mathematics, 1999). All the activities give students initial opportunities to explore, through hands-on experiences followed by a thoughtful journey through various, appropriate representations. The bridge to the algebraic representation is one that must be crossed carefully to ensure all students develop a true understanding of this abstract representation. The activities in unit 2 allow students to initially explore relationships numerically and graphically. The linear regression capabilities of graphing calculators provide a bridge for all students to develop an initial algebraic model. Dynamic Geometry Software is a powerful tool to allow all students to explore the connection between graphical and algebraic models.

Many activities require the use of technology: “The development of sophisticated yet easily used calculators and computers is changing the role of procedure and technique in mathematics. Operations that have been an essential part of a procedures-focused curriculum for decades can now be accomplished quickly and effectively using technology, so that students can now solve problems that were too time consuming to attempt, and can focus on underlying concepts. This curriculum integrates appropriate technologies into the learning and doing of mathematics ...” (page 3, The Ontario Curriculum, Grades 9 and 10, Mathematics, 1999).

In the area of assessment it is essential that examples of student work be provided to paint a clearer picture of the meanings of the levels and their descriptors for students, parents, and teachers.

**Mathematics, Applied, Grade 9
Strategies and Resources**

| Teaching and Learning Strategies | Assessment Strategies | Main Resources |
|--|--|---|
| <p>Teaching and learning strategies will include the following:</p> <p>Hypothesize - students will formulate hypotheses associated with relationships</p> <p>Explore/Investigate- through hands-on investigations of relationships</p> <p>Model/Formulate- students develop numeric, graphic, algebraic and geometric models for exploring relationships, dependencies and constraints</p> <p>Transform/Manipulate- students will develop numeric, graphic and algebraic skills as needed in the context of their investigations to allow them to move within and between representations</p> <p>Infer/Conclude - students will re-evaluate their hypotheses in light of their learning and make inferences to extend their learning</p> <p>Communicate- students, individually and in groups, orally and in writing, communicate the findings of their investigations by defending their mathematical models and explaining their reasoning</p> | <p>The assessment plan will include the following:</p> <p>Personal Communication</p> <ul style="list-style-type: none"> • journals • self/peer assessment • student-teacher conferences <p>Paper and Pencil</p> <ul style="list-style-type: none"> • tasks • unit tests • final exam • reports <p>Observation</p> <ul style="list-style-type: none"> • formal and informal <p>Performance Assessment</p> <ul style="list-style-type: none"> • oral presentations • culminating assessment task • written reports <p>Assessment tools will include:</p> <ul style="list-style-type: none"> • checklists • rubrics | <p>The following resources are required to support teaching and learning:</p> <p>Textbooks Student Textbook NCTM Standards</p> <p>Videotapes <i>Life By the Numbers</i>, PBS, 1998</p> <p>Computer Software Spreadsheet and Word processor (<i>Corel Suite 8, Microsoft Office</i>) Dynamic Geometry Software (<i>Cabri, Geometer's SketchPad, TI92</i>) Graphing Software (<i>Graphmatica or Zap-A-Graph</i>)</p> <p>Websites http://www.ti.com/calc/docs http://www.statcan.ca http://forum.swarthmore.edu/</p> <p>Technology and Manipulatives Graphing Calculators (<i>TI82/83/83Plus</i>), Data Collection Devices (<i>CBR, CBL and scientific probes</i>) Manipulatives</p> |

**Mathematics, Applied, Grade 9
Evaluation of Student Achievement**

| Knowledge/Skill Category Weighting | Course Grade Weighting | % |
|---|---|---------------------------------------|
| <p>Final Examination Focus on:</p> <ul style="list-style-type: none"> • Knowledge/Understanding • Application/Making Connections | <p>Final Examination Culminating Assessment Task</p> | <p>15 15</p> |
| <p>Final Assignment: Culminating Assessment Task Focus on:</p> <ul style="list-style-type: none"> • Thinking/Inquiry/Problem Solving • Communication | <p>Written Reports Oral Presentations Paper and Pencil Tasks Unit Tests</p> | <p>20 10 10 30</p> |
| <p>Written Reports Focus on:</p> <ul style="list-style-type: none"> • Thinking/Inquiry/Problem Solving • Communication | | |
| <p>Oral Presentations Focus on:</p> <ul style="list-style-type: none"> • Communication | | |
| <p>Paper and Pencil Tasks Focus on:</p> <ul style="list-style-type: none"> • Knowledge/Understanding • Application/Making Connections | | |
| <p>Unit Tests Focus on:</p> <ul style="list-style-type: none"> • Knowledge/Understanding • Application/Making Connections | | <p style="text-align: right;">100</p> |

Coded Expectations: Foundations of Mathematics, Applied Grade 9

Number Sense and Algebra Overall Expectations

- NAV.01** consolidate numerical skills by using them in a variety of contexts throughout the course;
- NAV.02** demonstrate understanding of the three basic exponent rules and apply them to simplify expressions;
- NAV.03** manipulate first-degree polynomial expressions to solve first-degree equations;
- NAV.04** solve problems, using the strategy of algebraic modelling.

Specific Expectations Consolidating Numerical Skills

- NA1.01** determine strategies for mental mathematics and estimation and apply these strategies throughout the course;
- NA1.02** demonstrate facility in operations with integers, as necessary to support other topics of the course (e.g., polynomials, equations, analytic geometry);
- NA1.03** demonstrate facility in operations with percent, ratio, rate and rational numbers, as necessary to support other topics of the course (e.g. analytical geometry, measurement);
- NA1.04** use a specific calculator effectively for applications that arise throughout the course;
- NA1.05** judge the reasonableness of answers to problems by considering likely results within the situation described in the problem;
- NA1.06** judge the reasonableness of answers produced by a calculator, a computer, or pencil and paper, using mental mathematics and estimation.

Operating Elements

- NA2.01** elevate numerical expressions involving natural-number exponents with rational-number bases;
- NA2.02** substitute into and evaluate algebraic expressions involving exponents, to support other topics of the course (e.g., measurement, analytical geometry);
- NA2.03** determine the meaning of negative exponents and of zero as an exponent from activities involving graphing, using technology, and from activities involving patterning;
- NA2.04** represent very large and very small numbers, using scientific notation;
- NA2.05** enter and interpret exponential notation on a scientific calculator, as necessary in calculations involving very large and very small numbers;
- NA2.06** determine, from the examination of patterns, the exponent rules for multiplying and dividing monomials and the exponent rule for the power of a power, and apply these rules in expressions involving one and two variables.

Manipulating Polynomial Expressions and Solving Equations

- NA3.01** add and subtract polynomials, and multiply a polynomial by a monomial
- NA3.02** expand and simplify polynomial expressions involving one variable;
- NA3.03** solve first-degree equations, including equations with fractional coefficients, using an algebraic method;
- NA3.04** calculate in right triangles, using the Pythagorean theorem, as required in topics throughout the course (e.g. measurement);
- NA3.05** substitute into measurement formulas and solve for one variable, with and without the help of technology

Using Algebraic Modelling to Solve Problems

- NA4.01** use algebraic modelling as one of several problem-solving strategies in various topics of the course (e.g. relations, measurement, direct and partial variation, Pythagorean theorem, percent);
- NA4.02** compare algebraic modelling with other strategies used for solving the same problem;
- NA4.03** communicate solutions to problems in approximate mathematical forms (e.g., written explanations, formulas, charts, tables, graphs) and justify the reasoning used in solving the problems.

Coded Expectations: Foundations of Mathematics, Applied Grade 9

Relationships

Overall Expectations

- REV.01** determine relationships between two variables by collecting and analysing data
- REV.02** compare the graphs and formulas of linear and non-linear relations;
- REV.03** describe the connections between various representations of relations.

Specific Expectations

Determining Relationships

- RE1.01** pose problems, identify variables, and formulate hypotheses associated with relationships (*Sample problem:* Does the rebound height of a ball depend on the height from which it was dropped? Make a hypothesis and design an experiment to test it.);
- RE1.02** demonstrate an understanding of some principles of sampling and surveying (e.g., randomization, representivity, the use of multiple traits) and apply the principles in designing and carrying out experiments to investigate the relationships between variables (*Sample problem:* What factors might affect the outcome of this experiment? How could you design the experiment to account for them?);
- RE1.03** collect data, using appropriate equipment and/or technology (e.g., measuring tools, graphing calculators, scientific probes, the Internet) (*Sample problem:* Drop a ball from varying heights, measuring the rebound height each time.);
- RE1.04** organize and analyse data, using appropriate techniques (e.g., making tables and graphs, calculating measures of central tendency) and technology (e.g., graphing calculators, statistical software, spread-sheets) (*Sample problem:* Enter the data into a spreadsheet. Decide what analysis would be appropriate to examine the relationship between the variables - a graph, measures of central tendency, ratios);
- RE1.05** describe trends and relationships observed in data, make inferences from data, compare the inferences with hypotheses about the data, and explain the differences between the inferences and the hypotheses (*Sample problem:* Describe any trend observed in the data. Does a relationship seem to exist? Of what sort? Is the outcome consistent with your original hypotheses? Discuss any outlying pieces of data and provide explanations for them. Suggest a formula relating the height of the visible region to the distance from the wall. How might you vary the experiment to examine other relationships?);
- RE1.06** communicate findings of an experiment clearly and concisely, using appropriate mathematical forms (e.g., written explanations, formulas, charts, tables, graphs), and justify the conclusions reached;
- RE1.07** solve and/or pose problems related to an experiment, using the findings of the experiment.

Comparing Linear and Non-linear Relations

- RE2.01** construct tables of values, graphs, and formulas to represent the linear relations derived from descriptions of realistic situations (e.g., the cost of holding a banquet in a rented hall is \$25 per person plus \$975 for the hall);
- RE2.02** construct tables of values and scatter plots for linearly related data collected from experiments (e.g., the rebound height of a ball versus the height from which it was dropped)
- RE2.03** determine the equation of a line of best fit for a scatter plot, using an informal process (e.g., a process of trial and error on a graphing calculator; calculation of the equation of the line joining two carefully chosen points of the scatter plot);
- RE2.04** construct tables of values and graphs to represent non-linear relations derived from descriptions of realistic situations (e.g., represent the relationship between the volume of a cube and its side length, as the side length varies.);
- RE2.05** demonstrate an understanding that straight lines represent linear relations and curves represent non-linear relations;

Describing Connections Between Representations of Relations

- RE3.01** determine values of a linear relation by using the formula of the relation and by interpolating or extrapolating from the graph of the relation (e.g., if a student earns \$5/hr caring for children, determine how long he or she must work to earn \$143);
- RE3.02** describe, in written form, a situation that would explain the events illustrated by a given graph or the relationship between two variables (e.g., write a story that matches the events shown in the graph);
- RE3.03** identify, by calculating finite differences in its table of values, whether a relation is linear or non-linear;
- RE3.04** describe the effect on the graph and the formula of a relation of varying the conditions of a situation they represent (e.g., if a graph showing partial variation represents the cost of producing a yearbook, describe how the appearance of the graph changes if the cost per book is altered; describe how it changes if the fixed costs are altered).

Coded Expectations: Foundations of Mathematics, Applied Grade 9

Analytical Geometry Overall Expectations

- AGV.01** determine, through investigation, the relationships between the form of an equation and the shape of its graph with respect to linearity and non-linearity;
- AGV.02** determine, through investigation, the properties of the slope and y-intercept of a linear relation;
- AGV.03** graph a line and write the equation of a line from given information.

Specific Expectations

Investigating the Relationship Between the Equation of a Relation and the Shape of Its Graph

- AG1.01** determine, through investigation, the characteristics that distinguish the equation of a straight line from the equation of non-linear relations (e.g., use graphing software to obtain the graphs of a variety of linear and non-linear relations from their equations; classify the relations according to the shapes of their graphs; focus on the characteristics of the equations of linear relations and how they differ from the characteristics of the equations of non-linear relations);
- AG1.02** select the equations of straight lines from a given set of equations of linear and non-linear relations;
- AG1.03** identify the equation of a line in any of the forms $y = mx + b$ as a standard form for the equation of a straight line, including the special cases $x = a$, $y = b$

Investigating the Properties of Slope

- AG2.01** identify practical situations illustrating slope (e.g., ramps, slides, staircases) and calculate the slopes of the inclines;
- AG2.02** determine the slope of a line segment, using the formula $m = \text{rise/run}$
- AG2.03** identify the geometric significance of m and b in the equation $y = mx + b$ through investigation
- AG2.04** identify properties of the slopes of line segments (e.g., direction, positive or negative rate of change, steepness, parallelism, perpendicularity) through investigations facilitated by graphing technology, where appropriate.

Graphing and Writing Equations of Lines

- AG3.01** plot points on the xy -plane and use the terminology and notation of the xy -plane correctly;
- AG3.02** graph lines by hand, using a variety of techniques (e.g., making a table of values using intercepts, using the slope and y-intercept);
- AG3.03** graph lines, using graphing calculators or graphing software;

AG3.04 determine the equation of a line, given the slope and y -intercept, the slope and point on the line, and two points on the line;

AG3.05 communicate solutions in established mathematical form, with clear reasons given for the steps taken;

Coded Expectations: Foundations of Mathematics, Applied Grade 9

Measurement and Geometry

Overall Expectations

- MGV.01** determine the optimal values of various measurements through investigations facilitated by the use of concrete materials, diagrams, and calculators or computer software;
- MGV.02** solve problems involving the measurement of two-dimensional figures and three-dimensional objects;
- MGV.03** formulate conjectures and generalizations about geometric relationships involving two-dimensional figures, through investigations facilitated by dynamic geometry software, where appropriate.

Specific Expectations

Investigating the Optimal Value of Measurements

- MG1.01** construct a variety of rectangles for a given perimeter and determine the maximum area for a given perimeter;
- MG1.02** construct a variety of square-based prisms for a given volume and determine the minimum surface area for a square-based prism with a given volume;
- MG1.03** construct a variety of cylinders for a given volume and determine the minimum surface area for a cylinder with a given volume;
- MG1.04** describe applications in which it would be important to know the maximum area for a given volume (e.g., building a fence, designing a container).

Solving Problems Involving Surface Area and Volume

- MG2.01** solve problems involving the area of composite plane figures (e.g., combinations of rectangles, triangles, parallelograms, trapezoids, and circles);
- MG2.02** solve simple problems using the formulas for the surface area of prisms and cylinders, and for the volume of prisms, cylinders, cones and spheres;
- MG2.03** solve problems involving perimeter, area, surface area, volume, and capacity in applications;
- MG2.04** judge the reasonableness of answers to measurement problems by considering likely results within the situation described in the problem;
- MG2.05** judge the reasonableness of answers produced by a calculator, a computer, or pencil and paper, using mental mathematics and estimation.

Coded Expectations: Foundations of Mathematics, Applied Grade 9

Investigating Geometric Relationships

- MG3.01** illustrate and explain the properties of the interior and exterior angles of triangles and quadrilaterals, and of angles related to parallel lines;
- MG3.02** determine the properties of angle bisectors, medians, and altitudes in various types of triangles through investigation;
- MG3.03** determine the properties of the sides and the diagonals of quadrilaterals (e.g., the diagonals of a rectangle bisect each other);
- MG3.04** communicate the findings of investigations, using appropriate language and mathematical forms (e.g., written explanations, diagrams, formulas, tables).

Ontario Catholic School Graduate Expectations

The graduate is expected to be:

A Discerning Believer Formed in the Catholic Faith Community who

- CGE1a** -illustrates a basic understanding of the **saving story** of our Christian faith;
- CGE1b** -participates in the **sacramental life** of the church and demonstrates an understanding of the centrality of the Eucharist to our Catholic story;
- CGE1c** -actively reflects on **God’s Word** as communicated through the Hebrew and Christian scriptures;
- CGE1d** -develops attitudes and values founded on Catholic **social teaching** and acts to promote social responsibility, human solidarity and the common good;
- CGE1e** -speaks the **language of life**... “recognizing that life is an unearned gift and that a person entrusted with life does not own it but that one is called to protect and cherish it.” (Witnesses to Faith)
- CGE1f** -seeks intimacy with God and celebrates **communion** with God, others and creation through prayer and worship;
- CGE1g** -understands that one’s purpose or **call in life** comes from God and strives to discern and live out this call throughout life’s journey;
- CGE1h** -respects the **faith traditions**, world religions and the life-journeys of **all people of good will**;
- CGE1i** -integrates faith with life;
- CGE1j** -recognizes that “sin, human weakness, conflict and forgiveness are part of the human journey” and that the cross, the ultimate sign of forgiveness is at the heart of **redemption**. (Witnesses to Faith)

An Effective Communicator who

- CGE2a** -listens actively and critically to understand and learn in light of gospel values;
- CGE2b** -reads, understands and uses written materials effectively;
- CGE2c** -presents information and ideas clearly and honestly and with sensitivity to others;
- CGE2d** -writes and speaks fluently one or both of Canada’s official languages;
- CGE2e** -uses and integrates the Catholic faith tradition, in the critical analysis of the arts, media, technology and information systems to enhance the quality of life.

A Reflective and Creative Thinker who

- CGE3a** -recognizes there is more grace in our world than sin and that hope is essential in facing all challenges;
- CGE3b** -creates, adapts, evaluates new ideas in light of the common good;
- CGE3c** -thinks reflectively and creatively to evaluate situations and solve problems;
- CGE3d** -makes decisions in light of gospel values with an informed moral conscience;
- CGE3e** -adopts a holistic approach to life by integrating learning from various subject areas and experience;
- CGE3f** -examines, evaluates and applies knowledge of interdependent systems (physical, political, ethical, socio-economic and ecological) for the development of a just and compassionate society.

A Self-Directed, Responsible, Life Long Learner who

- CGE4a** -demonstrates a confident and positive sense of self and respect for the dignity and welfare of others;
- CGE4b** -demonstrates flexibility and adaptability;
- CGE4c** -takes initiative and demonstrates Christian leadership;
- CGE4d** -responds to, manages and constructively influences change in a discerning manner;
- CGE4e** -sets appropriate goals and priorities in school, work and personal life;
- CGE4f** -applies effective communication, decision-making, problem-solving, time and resource management skills;
- CGE4g** -examines and reflects on one's personal values, abilities and aspirations influencing life's choices and opportunities;
- CGE4h** -participates in leisure and fitness activities for a balanced and healthy lifestyle.

A Collaborative Contributor who

- CGE5a** -works effectively as an interdependent team member;
- CGE5b** -thinks critically about the meaning and purpose of work;
- CGE5c** -develops one's God-given potential and makes a meaningful contribution to society;
- CGE5d** -finds meaning, dignity, fulfillment and vocation in work which contributes to the common good;
- CGE5e** -respects the rights, responsibilities and contributions of self and others;

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- CGE5f** -exercises Christian leadership in the achievement of individual and group goals;
 - CGE5g** -achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others;
 - CGE5h** -applies skills for employability, self-employment and entrepreneurship relative to Christian vocation.

A Caring Family Member who

- CGE6a** -relates to family members in a loving, compassionate and respectful manner;
- CGE6b** -recognizes human intimacy and sexuality as God given gifts, to be used as the creator intended;
- CGE6c** -values and honours the important role of the family in society;
- CGE6d** -values and nurtures opportunities for family prayer;
- CGE6e** -ministers to the family, school, parish, and wider community through service.

A Responsible Citizen who

- CGE7a** -acts morally and legally as a person formed in Catholic traditions;
- CGE7b** -accepts accountability for one's own actions;
- CGE7c** -seeks and grants forgiveness;
- CGE7d** -promotes the sacredness of life;
- CGE7e** -witnesses Catholic social teaching by promoting equality, democracy, and solidarity for a just, peaceful and compassionate society;
- CGE7f** -respects and affirms the diversity and interdependence of the world's peoples and cultures;
- CGE7g** -respects and understands the history, cultural heritage and pluralism of today's contemporary society;
- CGE7h** -exercises the rights and responsibilities of Canadian citizenship;
- CGE7i** -respects the environment and uses resources wisely;
- CGE7j** -contributes to the common good.