

Public and Catholic District School Board Writing Partnerships

Course Profile

Mathematics of Personal Finance

Grade 11
College Preparation
MBF3C

• *for teachers by teachers*

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Course Overview

Mathematics of Personal Finance, Grade 11, College Preparation, MBF3C

Prerequisite: Foundations of Mathematics, Grade 10, Applied

Course Description

This course promotes the development of problem-solving and decision-making skills in a realistic financial context. The concepts of exponential growth, sequences, and series are studied. These concepts are explored through the concrete applications of interest, investments, living accommodation, transportation, and budgets. The financial framework of the course utilizes individual career paths and projected incomes established using each student's Annual Education Plan (AEP). Course activities incorporate the technological tools appropriate for financial analysis. Upon successful completion of the course, students will have the skills necessary to make sound financial decisions in both post-secondary endeavours and personal life situations.

How This Course Supports the Ontario Catholic School Graduate Expectations

This course encourages the Catholic learner to develop his/her gifts and abilities to promote growth toward personal responsibility in preparation for a chosen career path. Throughout the course, emphasis should be placed on moral, ethical, and realistic decision-making in an effort to build responsible citizenship. The classroom environment should instill a spirit of cooperation, rather than competition amongst students, and should foster a collaborative sense of community. The course provides many opportunities for students to work effectively as interdependent team members and to acknowledge and respect the opinions of others.

Course Notes

Students in this course benefit from the following:

Making a Connection to Students' Career Paths

Emphasis should be placed on developing students' decision-making skills in a realistic framework. This can be initiated in Unit 1 through an exploration of career opportunities and prospective incomes. This career investigation should be individualized and consistent with each student's AEP, as developed in the Teacher Advisor Program. Making a connection between career paths and the curriculum fosters student interest and provides them with a context for course concepts.

Using Technology as a Tool for Learning

Society demands that people be proficient in the use of a variety of technological tools. As such, the integration of technology is a critical aspect of this course and should be used wherever applicable. The technological tools appropriate for the students of this course include: scientific calculators, graphing calculators, spreadsheet software, budgeting software, and the Internet. The proper use of technology can reinforce student understanding and facilitates problem solving.

A Focus on Student Decision-Making

The basis of financial planning is the ability to make informed decisions that can be justified using mathematical reasoning. Students should be encouraged to communicate and support their decisions with the use of appropriate mathematical tools. Teachers should provide the opportunity for students to make financial choices based on real-life scenarios to better prepare students for their financial futures.

A Strategic Course Development

The organization of this course fosters a logical progression of concepts for the student. In Unit 1, the investigation of realistic incomes related to chosen career paths captures student interest and creates a more personal learning environment. Projected incomes from Unit 1 can be integrated into a study of basic savings options and the mathematics of interest in Unit 2. The mathematics of financial growth investigated in Unit 3 will be applied to investment strategies in Unit 4. The financial implications of living accommodation and transportation costs are studied in Units 5 and 6. The impact of various factors on personal household budgets is examined in Unit 7. In Unit 8, students apply their knowledge of previously learned concepts to the creation of a comprehensive long-term financial plan reflective of the career path chosen in unit one.

Units: Titles and Time

Unit 1	Investigating Income Opportunities	6 hours
Unit 2	It's of INTEREST to You	14 hours
Unit 3	The Mathematics of Financial Growth	16 hours
Unit 4	Sequences and Series and their Financial Applications	20 hours
* Unit 5	Home Sweet Home	20 hours
Unit 6	Getting Behind the Wheel	10 hours
* Unit 7	Managing Your Money	17 hours
Unit 8	Summative: Planning your Financial Future	7 hours

* These units are fully developed in this Course Profile.

Unit Overviews

Unit 1: Investigating Income Opportunities

Time: 6 hours

Unit Description

Students explore a variety of occupations of personal interest that are attainable through their chosen educational path. Expected incomes and educational/training costs involved for their careers of choice are researched and analysed. This topic provides a vehicle for the teacher to review such mathematical concepts as data management, trend analysis, and approaches to problem-solving. Students investigate occupations projected to be in high demand and the educational paths required to enter these fields. It is recommended that students use the anticipated income from one or two potential careers as a focus for the course. This forms the framework for investigations in the remaining units on such topics as affordable mortgages, investment opportunities, and personal budgeting.

Unit Overview Chart

Cluster	Expectations	Assessment	Focus
1	PFV.05, PF5.01, PF5.02, PF5.03 CGE2c, CGE4f, CGE4g, CGE5b	Knowledge/Understanding Communication Thinking/Inquiry/Problem Solving	Investigate Careers and Income Potential

Unit 2: It's of INTEREST to You

Time: 14 hours

Unit Description

Students expand their knowledge of various savings options offered by financial institutions. Simple interest and compound interest are explored in the context of savings plans, with and without the use of technology. An understanding of compounding is used to examine the nature of exponential growth. Students describe the significance of exponential growth as represented by tables, graphs, and equations. Models of exponential functions are provided to allow the students to apply their knowledge. Students use their acquired knowledge and their chosen career path to make decisions about realistic savings alternatives and justify these decisions mathematically.

Unit Overview Chart

Cluster	Expectations	Assessment	Focus
1	PFV.04, CIV.03, PF4.01, PF4.02, CI3.01 CGE2b	Knowledge/Understanding Communication Application	Comparing Types of Savings Options
2	CIV.02, CIV.03, PFV.04, PF4.01, PF4.02, CI2.01, CI2.02, CI2.03, CI3.02 CGE4f, CGE5a	Knowledge/Understanding Application	Calculating Interest: Simple and Compound
3	EGV.01, EG1.01, EG1.02, EG1.03 CGE2b, CGE2c, CGE3c	Thinking/Inquiry/Problem Solving Application	Exploring the Nature of Exponential Growth
4	PFV.04, PF4.04, PF4.05 CGE2b, CGE2c	Thinking/Inquiry/Problem Solving Communication	Choosing Savings Accounts

Unit 3: The Mathematics of Financial Growth

Time: 16 hours

Unit Description

Students sketch the graphs of simple exponential functions given their equations, and compare the rates of change of different types of functions. Emphasis will be placed on those functions which relate to financial growth through investigation with technology, the properties of exponential functions with equations of the form $y = a^x$, and their graphs are analysed. Students evaluate simple expressions involving natural, rational and integral exponents, with and without the use of technology. Students perform operations to solve exponential equations involving common bases.

Unit Overview Chart

Cluster	Expectations	Assessment	Focus
1	EGV.02, EG2.01, EG2.02 CGE4e, CGE5a	Knowledge/Understanding Thinking/Inquiry/Problem Solving	Exploring Exponential Functions without technology
2	EGV.02, EG2.03 CGE5a, CGE5b	Communication Thinking/Inquiry/Problem Solving	Exploring exponential functions using technology
3	EGV.03, EG3.01, EG3.02, EG3.03, EG3.04, EG3.05 CGE4e, CGE5a	Knowledge/Understanding Application	Manipulating and Solving Exponential Expressions

Unit 4: Sequences and Series and their Financial Applications

Time: 20 hours

Unit Description

Students identify terms in a sequence and differentiate between geometric and arithmetic forms. Relationships between interest calculations and sequences and series are explored. Using scientific calculators, students solve various problems involving ordinary annuities and apply this knowledge to investment decisions. Through investigation and calculation, comparisons are made between investment alternatives and their associated risks. Students make informed investment decisions and justify their reasoning for such decisions.

Unit Overview Chart

Cluster	Expectations	Assessment	Focus
1	CIV.01, CII.01, CII.02, CII.03 CGE4e, CGE5a	Knowledge/Understanding	Examining Sequences and Series
2	CIV.02, CI2.06, CI2.07 CGE4e, CGE5a	Application	Applying Sequences and Series to Interest Problems
3	CIV.02, CI2.04, CI2.05 CGE5b	Application Thinking/Inquiry/Problem Solving	Problem-solving with Annuities
4	CIV.03, PFV.04, CI3.03, CI3.04, PF4.03, PF4.04, PF4.05 CGE2b, CGE2c, CGE5e	Thinking/Inquiry/Problem Solving Communication	Making Investment Decisions

Unit 5: Home Sweet Home

Time: 20 hours

Unit Description

Students investigate costs and make comparisons among various types of accommodations, summarizing their findings in presentations. Common mortgage terminology is introduced and the methods of compounding mortgage interest are explored. Appropriate technology is used to calculate total interest and to determine the time required to pay off a mortgage when specific mortgage features are varied (i.e., payment frequency, amortization period, and payment amounts). Students use mathematical analysis as a basis for sound accommodation decision-making.

Unit Overview Chart

Cluster	Expectations	Assessment	Focus
1	PFV.02, PFV.04, PF2.01, PF2.02, PF2.03, PF2.04, PF4.01, PF4.02, PF4.03, PF4.04 CGE2b, CGE2c, CGE3c	Knowledge/ Understanding Communication Thinking/Inquiry/ Problem Solving	Exploring Accommodation Alternatives
2	CIV.03, CI3.05, CI3.06 CGE2b, CGE4f	Knowledge/ Understanding Thinking/Inquiry/ Problem Solving	Investigating Mortgage Terminology and Interest Calculations
3	CIV.03, CI3.07, CI3.08 CGE5a	Application	Developing Amortization Tables

4	CIV.03, PFV.04, CI3.09, CI3.10, PF4.05 CGE4f, CGE5a	Application Thinking/Inquiry/ Problem Solving	Investigating Mortgage Features
5	PFV.02, PFV.04, PF2.02, PF2.03, PF2.04, PF4.03, PF4.04, PF4.05 CGE2b, CGE2c, CGE3c	Thinking/Inquiry/ Problem Solving Communication	Making Accommodation Decisions

Unit 6: Getting Behind the Wheel

Time: 10 hours

Unit Description

Students explore and compare the purchasing costs, ownership costs, and features of new and used vehicles. The financial options of leasing and purchasing vehicles are investigated and compared. Students collect and analyse information on specific vehicles and communicate a well-justified decision regarding vehicle and financing choice.

Unit Overview Chart

Cluster	Expectations	Assessment	Focus
1	PFV.01, PFV.04, PF1.01, PF1.03, PF4.01 CGE4f, CGE5a	Knowledge/Understanding Communication Thinking/Inquiry/Problem Solving	Exploring Vehicle Costs
2	PFV.01, CIV.03, PF1.02, CI3.13, PF4.01 CGE4f, CGE5a	Knowledge/Understanding Application	Comparing Buying vs. Leasing
3	PFV.01, PFV.04, CIV.03, PF1.04, PF4.02, PF4.03, PF4.04, PF4.05, CI3.14 CGE2b, CGE2c, CGE3c, CGE5e	Thinking/Inquiry/Problem Solving Communication	Making Vehicle Purchase Decisions

Unit 7: Managing your Money

Time: 17 hours

Unit Description

The impact of various factors on household budgeting is examined. Students investigate the impact of types of retailing on the buyer. Currency conversions are analysed and the impact of foreign exchange rates on the purchases and/or travel plans of the consumer is considered. This leads to an examination of credit card/debit card features and the short-term and long-term effects of carrying credit card debt. Students apply this information, together with the income potential expected from their chosen career path, to design and justify budgets for a variety of family groupings. A variety of technological tools, including spreadsheets and the Internet facilitate explorations in this area.

Unit Overview Chart

Cluster	Expectations	Assessment	Focus
1	PFV.04, PF4.07 CGE5a	Knowledge/Understanding	The Impact of Currency Exchange on the Buyer
2	PFV.04, PF4.06 CGE5a, CGE4f	Thinking/Inquiry/Problem Solving	Investigating the Impact of Selling Techniques on the Buyer

3	CIV.03, CI3.11, CI3.12 CGE7b	Knowledge/Understanding Application	Investigating the Features of Credit and Debit Cards
4	PFV.03, PF3.01, PF3.02, PF3.03 CGE2b, CGE2c, CGE3c	Thinking/Inquiry/Problem Solving Communication	Exploring living costs for a Variety of Family Groupings
5	PFV.01, PFV.02, PFV.03, PFV.04, PFV.05, PF3.04 CGE2b, CGE2c, CGE3c, CGE5e	Thinking/Inquiry/Problem Solving Communication	Designing a Budget Considering Factors Affecting Budget Plans

Unit 8: Summative Assessment: Planning your Financial Future

Time: 7 hours

Unit Description

Students use their chosen career path and the anticipated salary as the basis for the creation of a realistic long-term financial plan. Specific decisions related to investments, accommodation choice and vehicle purchases are made in support of the achievement of specific future goals. Students use the knowledge acquired throughout the course and appropriate technology to justify their choices.

Unit Overview Chart

Cluster	Expectations	Assessment	Focus
1	CIV.02, CIV.03, PFV.01, PFV.02, PFV.03, PFV.04, CI2.05, CI3.13, CI3.14, PF1.04, PF2.04, PF3.03, PF3.04, PF4.01, PF4.02, PF4.03, PF4.04, PF4.05 CGE3c, CGE4f, CGE4g, CGE5g, CGE7b	Knowledge/Understanding Application Thinking/Inquiry/Problem Solving Communication	Financial Planning to Achieve Goal

Teaching/Learning Strategies

The use of a variety of Teaching/Learning Strategies provides students with multiple ways to learn the knowledge and skills, and a variety of ways to demonstrate what they know and can do.

In the use of this Course Profile, teachers should:

- integrate the technological tools and software available to promote students' exploration and understanding of mathematical concepts;
- consider the use of classroom demonstrations in situations where technological tools for each student are not available, e.g., use of a computer projection device, sample print-out from spreadsheet applications;
- invite guest speakers to enhance the relevancy of course material;
- make reference to individual student's AEPs to establish a realistic framework for student work in the course;
- use a variety of media resources (e.g., newspapers, Internet, magazines)
- offer a variety of instructional methods (experimental investigations, use of various forms of technology, station-based activities, use of visual aids, etc.) to account for multiple learning styles;
- provide opportunities for students to present mathematical results in a variety of different presentation formats;
- utilize a balance of whole-class, small group, and individual instruction through student-centred and teacher-directed activities.

In achieving the expectations of this course, students:

- demonstrate their knowledge and understanding using a variety of methods and mathematical/technological tools;
- develop responsibility for their own learning and decision-making;
- recognize the importance of course material as it pertains to their future;
- increase their proficiency with technology, particularly as a support for financial decision-making;
- become informed financial decision-makers, aware of the options available to all consumers;
- are able to work individually and cooperatively;
- summarize and support decisions using a variety of strategies.

Assessment and Evaluation of Student Achievement

To effectively evaluate student achievement, a balance of diagnostic, formative, and summative assessment instruments should be used. Students must be assessed and evaluated on all learning expectations set out by the curriculum documents. A variety of assessment tools including observational checklists, performance criteria, rubrics, the Achievement Chart for Mathematics, marking schemes, and rating scales. Peer, and self-assessment should be utilized.

Specific tools which may be considered when evaluating student achievement according to Achievement Chart categories are provided below. These lists are not comprehensive, but may serve as a guide for evaluating student achievement.

Knowledge/Understanding

Achievement in this category reflects the student's ability to demonstrate understanding of mathematical concepts and to perform algorithms.

To evaluate Knowledge/Understanding consider the use of:

- Quizzes and daily drills;
- Short-answer and skill-based calculations on unit tests and exams;
- Student-teacher conferencing;
- Accuracy of mathematical answers in reports and presentations.

Thinking/Inquiry/Problem-solving

Achievement in this category reflects the student's ability to demonstrate reasoning and to apply the steps of an inquiry/problem-solving process effectively. This category lends itself to the use of rubrics due to the open-ended nature of many of the problems.

To evaluate Thinking/Inquiry/Problem-solving consider the use of:

- Broad-based, open-ended problems on unit tests and exams;
- Rich assessment tasks and assignments;
- Observation of problem-solving strategies used in group-work;
- Student-teacher conferencing;
- Tasks requiring complexity of mathematical reasoning in reports and presentations.

Application

Achievement in this category reflects the student's ability to apply concepts and procedures to familiar and unfamiliar settings.

To evaluate Application consider the use of:

- Appropriate application of technological tools;
- Rich problems on unit tests and exams;
- Application of mathematical knowledge and understanding in reports and presentations.

Communication

Achievement in this category reflects the student's ability to communicate his/her reasoning using mathematical language, symbols, and conventions. Rubrics are an effective and efficient tool when evaluating presentations and displays.

To evaluate Communication consider the use of:

- Verbal presentation of homework solutions;
- Appropriate use of mathematical language and terminology on tests and assignments;
- Journals;
- Use of visual aids during presentations;
- Clarity of written expression in solutions;
- Observation of student interaction during group work;
- Clarity of mathematical reasoning in reports and presentations.

An Evaluation Breakdown

The course evaluation must consist of 70% term work and 30% summative assessment.

It is suggested that students maintain a portfolio to support Unit 8 investigations. The portfolio could include:

- Investigation of career path information (Unit 1)
- Selection of appropriate savings options (Unit 2)
- Description of investment decisions (Unit 4)
- Explanation of accommodation and vehicle choices (Unit 5 and Unit 6)
- Proposed personal budget (Unit 7) based on projected income and expenses

To assess Learning Skills

Teachers should be aware that learning skills are not to be included in the determination of the percentage grade. However, learning skills need to be assessed and reported separately on the student report cards and should be tracked throughout the term.

The following is a partial list of suggested indicators of learning skills:

Organization

- Preparedness (materials for class)
- Submitted work (including timeliness)

Work Habits

- Completion of homework
- Use of class time

Team Work

- Cooperation in group setting
- Contribution in group setting

Initiative

- Display of leadership
- Participation in class discussion
- Responsibility for own learning

Works Independently

- Commitment to task
- Effort in solving problems individually

Accommodations

Teachers should refer to the students' Individual Education Plan (IEP) and consider their particular learning characteristics to make any necessary accommodations. Teachers should work in consultation with resource teachers, ESL/ELD teachers, and parents or guardians to determine appropriate accommodations as they work through the course to achieve the expectations described in the IEP.

Partial List of Student Accommodations

- Provide for flexible timelines regarding the completion of projects and assignments.
- Provide oral pre-planning of activities with students
- Allow students to work in alternate settings (e.g., resource room) where students can receive assistance with problems
- Provide alternate formats for assignments (e.g., written report, oral presentation, demonstration)
- Provide multiple opportunities to be successful on tasks or tests
- Make accommodations with respect to test and exam writing environments (e.g., time, use of technology, use of scribe, etc.)

Accommodations for ESL/ELD Students

- Have ESL students work in pairs, with peer tutors, with classmates that have the same linguistic background, or with cooperative supportive groups.
- Use peer conferencing to reinforce instructions or information.
- Ask an ESL/ELD teacher to review questions, assignments, or assessment instruments.
- Provide sets of reference notes, outlines, or critical information, as well as models of charts, timelines, or diagrams.
- Reinforce main ideas by using the think/pair/share peer-assessment strategy.
- Pair written instructions with verbal instructions.
- Use visuals to illustrate definitions.
- Simplify instructions.
- Highlight key words or phrases.
- Brainstorm in groups using the students' first language if their usage of English is limited.
- Provide opportunities for students to practice oral presentation skills.
- Allow students opportunities to practice oral presentation skills in non-intimidating environments.
- Provide visual or auditory cues.

Accommodations for Students with Learning Disabilities

- Provide extensive student-teacher conferencing.
- Provide a list of terms (possibly simplified) before an activity begins.
- Modify handouts in terms of the terminology and content used, as well as the size and typeface of the selected font. Allow plenty of space for written responses.
- Allow assignments to be completed in alternate formats or using longer timelines.
- Keep manipulatives, grid paper, formula sheets, and other aids available for needs that arise.
- Contact parents or guardians for support and suggestions.
- Provide the students with oral pre-planning of activities.

Resources

Note: The URLs for the websites have been verified by the writer prior to publication. Given the frequency with which these designations change, teachers should always verify the websites prior to assigning them for student use.

Print

- Airasian, P.W. *Classroom Assessment*. New York: McGraw-Hill, 1994.
- Andrini, B. *Cooperative Learning and Mathematics: A Multi-Structural Approach*. California: Resources for Teachers. 1991.
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- OAME, *The Mathematics Gazette*. Forest: Pole Printing.
- O'Neil, J. "Putting Performance Assessment to the Test." *Educational Leadership* 49, 8:14-19. 1992.
- Romberg, T.A., ed. *Reform in School Mathematics and Authentic Assessment*. New York: State University of New York Press. 1995.
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- Silver, E.A., et al. *Thinking Through Mathematics: Fostering Inquiry and Communication in Mathematics Classrooms*. New York: College Entrance Examination Board. 1990.
- Stepien, W. and S. Gallagher. "Problem-Based Learning: As Authentic As It Gets." *Educational Leadership* 50, 7:25-28. 1993.
- Trafford, Larry. *Educating the Soul: Writing Curriculum for Catholic Secondary Schools*. Toronto: Institute for Catholic Education. 1998.

Websites

- Career Information - www.coolmath.com/careers.htm
- <http://on.cx.bridges.com>
- Education Network of Ontario - www.enoreo.on.ca
- Internet Public Library - <http://www.ipl.org>
- MathForum - <http://forum.swarthmore.edu>
- National Council of Teachers of Mathematics - <http://www.nctm.org>
- Ontario Association for Mathematics Education (OAME) - <http://www.oame.ca>
- Texas Instruments - <http://www.ti.com/calc/docs>

Partial List of Ministry-Licensed Software

ClarisWorks (spreadsheet)

Microsoft Works V3.0 (spreadsheet)

Corel WordPerfect Suite8 (spreadsheet)

OSS Considerations

There is an opportunity to collaborate across departments throughout the implementation of this program. Student learning is enhanced by links between career studies in guidance and career classes, cooperative education classes, and the explorations in this course. The Annual Education Plan is a valuable platform for student decision-making. Other considerations in implementing this profile are:

The Ontario Curriculum Grades 11 and 12 – Mathematics, 2000

Ontario Secondary Schools, Grades 9 to 12, Program and Diploma Requirements, 1999

The Ontario Curriculum, Grades 9 to 12, Program Planning and Assessment 2000

Anti-Discrimination Policies:

Refer to local board documents (e.g., anti-racism and ethno-cultural equity policy documents)

Equity/Social Justice Issues:

Refer to local board documents (e.g., anti-harassment policies)

Refer to the Ontario School Code of Conduct

Career Goals/Cooperative Education:

Ontario Youth Apprenticeship Program

Youth Employment Skills Program

Community Partnerships:

Refer to local board policies

Coded Expectations, Mathematics of Personal Finance, Grade 11, College Preparation, MBF3C

Models of Exponential Growth

Overall Expectations

- EGV.01 · demonstrate an understanding of the nature of exponential growth;
- EGV.02 · describe the mathematical properties of exponential functions;
- EGV.03 · manipulate expressions related to exponential functions.

Specific Expectations

Understanding the Nature of Exponential Growth

- EG1.01 – describe the significance of exponential growth or decay within the context of applications represented by various mathematical models (e.g., tables of values, graphs, equations);
- EG1.02 – compare the effects of exponential growth within a context (e.g., interest earned, population size) with the effects of linear or quadratic growth within the same context;
- EG1.03 – pose and solve problems related to models of exponential functions drawn from a variety of applications, and communicate the solutions with clarity and justification.

Describing the Mathematical Properties of Exponential Functions

- EG2.01 – sketch the graphs of simple exponential functions, given their equations [e.g., those with equations $y = 2^x$, $y = 10^x$, $y = (\frac{1}{2})^x$], without using technology;
- EG2.02 – compare the rates of change of different types of functions (e.g., those with equations $y = 2x$, $y = x^2$, $y = 2^x$);
- EG2.03 – identify, through investigations, using graphing calculators or graphing software, the key properties of exponential functions with equations of the form $y = a^x$ ($a > 0$, $a \neq 1$) and their graphs (e.g., the domain is the set of the real numbers; the range is the set of the positive real numbers; the function either increases or decreases throughout its domain; the graph has the x -axis as an asymptote and has y -intercept = 1).

Manipulating Expressions

- EG3.01 – demonstrate the quick recall or calculation of simple powers of natural numbers (e.g., 2^8 , 6^3 , 5^4 , 20^2), without using technology;
- EG3.02 – evaluate simple numerical expressions involving rational exponents, without using technology;
- EG3.03 – evaluate numerical expressions involving negative and decimal exponents, using scientific calculators;
- EG3.04 – simplify algebraic expressions involving integral exponents, using the laws of exponents;
- EG3.05 – solve exponential equations involving common bases (e.g., $2^x = 32$, $4^{5x-1} = 4^{x+11}$, $3^{5x+8} = 27^x$).

Applications of Compound Interest and Annuities

Overall Expectations

- CIV.01 · solve problems involving arithmetic and geometric sequences and series;
- CIV.02 · solve problems involving compound interest and annuities;
- CIV.03 · demonstrate an understanding of the effect on investment and borrowing of compounding interest.

Specific Expectations

Solving Problems Involving Arithmetic and Geometric Sequences and Series

- CI1.01 – determine terms that follow three or more given terms in a sequence;
- CI1.02 – determine whether a sequence is arithmetic or geometric, or neither;
- CI1.03 – solve problems related to the formulas for the n th term and the sum of n terms of arithmetic and geometric sequences and series.

Solving Problems Involving Compound Interest and Annuities

- CI2.01 – solve problems involving the calculation of any variable in the simple-interest formula ($I = Prt$), using scientific calculators;
- CI2.02 – solve problems involving the calculation of the amount (A) and the principal (P) in the compound-interest formula $A = P(1 + i)^n$, using scientific calculators;
- CI2.03 – solve problems involving the calculation of the interest rate per period (i) and the number of periods (n) in the compound-interest formula $A = P(1 + i)^n$, using a spreadsheet;
- CI2.04 – solve problems involving the calculation of the amount and the regular payment in the formula for the amount of an ordinary annuity, using scientific calculators;
- CI2.05 – solve problems involving the calculation of the present value and the regular payment in the formula for the present value of an ordinary annuity, using scientific calculators;
- CI2.06 – demonstrate an understanding of the relationships between simple interest, arithmetic sequences, and linear growth;
- CI2.07 – demonstrate an understanding of the relationships between compound interest, geometric sequences, and exponential growth.

Understanding the Effect of Compounding

- CI3.01 – determine, through investigation, the characteristics of various savings alternatives available from a financial institution (e.g., savings accounts, GICs);
- CI3.02 – determine the effect of compound interest on deposits made into savings accounts (e.g., determine the doubling period of a single deposit; demonstrate the effect of saving a small amount on a regular basis; compare the effects of different compounding periods);
- CI3.03 – determine, through investigation, the properties of a variety of investment alternatives (e.g., stocks, bonds, mutual funds, real estate), and compare the alternatives from the point of view of risk versus return;
- CI3.04 – demonstrate, through calculation, the advantages of early deposits to long-term savings plans (e.g., compare the results of making an annual deposit of \$1000 to an RRSP, beginning at age 20, with the results of making an annual deposit of \$3000, beginning at age 50);
- CI3.05 – identify the common terminology and features associated with mortgages;
- CI3.06 – describe the manner in which interest is usually calculated on a mortgage (i.e., compounded semi-annually but calculated monthly) and compare this with the method of interest compounded monthly and calculated monthly;
- CI3.07 – generate an amortization table for a mortgage, using a spreadsheet or other appropriate software;
- CI3.08 – calculate the total amount of interest paid over the life of a mortgage, using a spreadsheet or other appropriate software, and compare the amount with the original principal of the mortgage or value of the property;
- CI3.09 – compare the effects of various payment periods, payment amounts, and interest rates on the length of time needed to pay off a mortgage;
- CI3.10 – demonstrate, through calculations, using technology, the effect on interest paid of retiring a loan before it is due;
- CI3.11 – determine, through investigation, the features of various credit and debit cards;

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- CI3.12** – demonstrate, using technology, the effects of delayed payment on a credit card balance, on the basis of current credit card rates and regulations;
- CI3.13** – calculate the cost of borrowing to purchase a costly item (e.g., a car, a stereo);
- CI3.14** – design an effective financial plan to facilitate the achievement of a long-term goal (e.g., attending college, purchasing a car, moving into an apartment, purchasing a house, establishing a small business).

Personal Financial Decisions

Overall Expectations

- PFV.01** · demonstrate an understanding of the costs involved in owning and operating a vehicle;
- PFV.02** · determine, through investigation, the relative costs of renting an apartment and buying a house;
- PFV.03** · design effective personal and household budgets for individuals and families described in case studies;
- PFV.04** · demonstrate the ability to make informed decisions involving life situations;
- PFV.05** · apply decision making in the investigation of career opportunities.

Specific Expectations

Owning and Operating a Vehicle

- PF1.01** – identify the procedures, costs, advantages, and disadvantages involved in buying a new vehicle and a used vehicle;
- PF1.02** – compare the costs involved in buying versus leasing the same vehicle;
- PF1.03** – calculate the fixed and variable costs involved in owning and operating a vehicle (e.g., the licence fee, insurance, maintenance);
- PF1.04** – determine, through investigation, the cost of purchasing or leasing a chosen new vehicle or purchasing a chosen used vehicle, including financing.

Renting or Buying Accommodation

- PF2.01** – collect, organize, and analyse data involving the costs of various kinds of accommodation in the community;
- PF2.02** – compare the costs of maintaining an apartment with the costs of maintaining a house;
- PF2.03** – compare the advantages and disadvantages of renting accommodation with the advantages and disadvantages of buying accommodation;
- PF2.04** – summarize the findings of investigations in effective presentations, blending written and visual forms.

Designing Budgets

- PF3.01** – describe and estimate the living costs involved for different family groupings (e.g., a family of four, including two young children; a single young person; a single parent with one child);
- PF3.02** – design a budget suitable for a family described in a given case study, reflecting the current costs of common items (e.g., interest rates, utility rates, rents), using technology (e.g., spreadsheets, budgeting software, the Internet);
- PF3.03** – explain and justify budgets, using appropriate mathematical forms (e.g., written explanations, charts, tables, graphs, calculations);
- PF3.04** – determine the effect on an overall budget of changing one component, using a spreadsheet or budgeting software.

Making Informed Decisions

PF4.01 – describe a decision involving a choice between alternatives (e.g., Which program should I study at college? What car should I buy? Should I stay at home or rent an apartment?);

PF4.02 – collect relevant information related to the alternatives to be considered in making a decision;

PF4.03 – summarize the advantages and disadvantages of the alternatives to a decision, using lists and organization charts;

PF4.04 – compare alternatives by rating and ranking information and by applying mathematical calculations and analysis, as appropriate (e.g., calculating loan payments or interest rates; constructing graphs or tables), using technology;

PF4.05 – explain the process used in making a decision and justify the conclusions reached;

PF4.06 – identify the advantages and disadvantages to the purchaser of various types of selling (e.g., retail store, catalogue, telemarketing, multilevel marketing, Internet) and techniques of selling (the use of loss leaders, the use of incentives such as coupons or Air Miles);

PF4.07 – compare the value of the Canadian dollar with the values of foreign currencies over a period of time and identify possible effects on purchasing and travel decisions.

Investigating Career Opportunities

PF5.01 – identify the advantages and disadvantages of a variety of occupations of personal interest;

PF5.02 – compare the expected income for a variety of occupations with the costs of the education or training required;

PF5.03 – analyse employment trends to identify some occupations that are in high demand, and identify the skills required and the education paths recommended in order to qualify for these occupations.

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;
- 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.

Unit 5: Home Sweet Home

Time: 20 hours

Description

Students investigate costs and make comparisons among various types of accommodations, summarizing their findings in presentations. Common mortgage terminology is introduced and the methods of mortgage interest compounding are explored. Appropriate technology is used to calculate total interest and to determine the time required to “pay off” a mortgage when specific mortgage features are varied (i.e., payment frequency, amortization period, and payment amounts). Students use mathematical analysis as a basis for sound accommodation decision-making.

Activity	Time	Expectations	Assessment	Tasks
1. Out On My Own	150 min	PFV.02, PFV.04, PF2.01, PF2.02, PF2.03, PF2.04, PF4.01, PF4.02, PF4.03, PF4.04	Knowledge/ Understanding Communication Thinking/Inquiry/ Problem Solving	Explore accommodation alternatives in the context of moving out on their own
2. Are You Ready to Buy?	225 min	CIV.03, CI3.05, CI3.06	Knowledge/ Understanding	Develop understanding of mortgages and demonstrate this through a classroom simulation
3. Table Talk	300 min	CIV.03, CI3.07, CI3.08	Application Thinking/Inquiry/ Problem Solving	Investigate amortization tables and create using technology
4. How'd They Do That?	300 min	CIV.03, PFV.04, CI3.09, CI3.10, PF4.05	Application Thinking/Inquiry/ Problem Solving	Manipulate mortgage features to observe the effect on total interest paid
5. Summative: Check It Out!	225 min	PFV.02, PFV.04, PF2.02, PF2.03, PF2.04, PF4.03, PF4.04, PF4.05	Thinking/Inquiry/ Problem Solving Communication	Make an accommodation decision based on a specific scenario using mathematical justification

Activity 1: Out On My Own

Time: 150 minutes

Description

Students collect information from various sources on types of accommodation in a specific community. Students collect and compare information on the cost of university or college residence, rental accommodation and the purchase of a home. Students present their researched options in the form of a written letter to their parent/guardian(s).

Strand(s) & Learning Expectations

Strand(s): Personal Finance Decisions

Overall Expectations

PFV.02 - determine, through investigation, the relative costs of renting an apartment and buying a house;
PFV.04 - demonstrate the ability to make informed decisions involving life situations.

Specific Expectations

PF2.01 - collect, organize, and analyse data involving the costs of various kinds of accommodation in the community;

PF2.02 - compare the costs of maintaining an apartment with the costs of maintaining a house;

PF2.03 - compare the advantages and disadvantages of renting accommodation with the advantages and disadvantages of buying accommodation;

PF2.04 - summarize the findings of investigations in effective presentations, blending written and visual forms;

PF4.01 - describe a decision involving a choice between alternatives (e.g., Which program should I study at college? What car should I buy? Should I stay at home or rent an apartment?);

PF4.02 - collect relevant information related to the alternatives to be considered in making a decision;

PF4.03 - summarize the advantages and disadvantages of the alternatives to a decision using lists and organization charts;

PF4.04 - compare the alternatives by rating and ranking information and by applying mathematical calculations and analysis, as appropriate (e.g., calculating loan payments or interest rates; constructing graphs or tables), using technology.

Planning Notes

- Collect local newspapers, real estate magazines, local housing guides, sample lease agreements, etc.
- Make arrangements for the use of the Internet if possible.
- Borrow college and university calendars with residency information from the guidance department.
- Acquire copies of a residential tenancy agreement (see Resources).
- Obtain brochures from financial institutions on mortgage information.
- Sticky notes (5/student) are recommended.

Teaching/Learning Strategies

Teacher Facilitation

- Introduce a discussion with students regarding the various decisions that would need to be made if you were to leave home to go to college.
- Lead student discussion towards a focus on accommodation decisions.
- Distribute collected resources throughout classroom to allow students to explore options.
- Provide each student with five sticky notes.
- Instruct students to record five different accommodation options from the provided resources with an estimated monthly cost on each sticky note.
- Instructing student groups of three or four to share their researched accommodations.
- Suggest that within their group the students move the sticky notes around to classify them in some manner (cost, type, etc.).
- Facilitate a discussion on the possible classification system for these options. If students have not proposed the option of buying, mention this possibility. Conclude the discussion by grouping all of the sticky notes on the front board into the following categories: college residence, renting off-campus or buying. Suggest that within each type, options could be classified even further. For example, within renting, options could include a division between single and multiple bedroom units.
- Instruct students to use the cost information on the sticky note to establish an “average” cost for each type of accommodation. For example, the average cost to rent a 2-bedroom apartment is \$785/month.
- Instruct students to compare their “average values” to the “average values” determined by other groups. Discuss the reason for the difference.
- Lead a discussion as to the validity of their results. Have students consider how they can achieve a more valid figure in the classroom (i.e., take averages using more figures).

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- Instruct students to combine all of their figures (by accommodation chart category) on the front board and find an average.
 - Questions to be considered during a discussion of the results: Are the rental figures consistent regarding what utilities are included? What considerations (other than cost) exist when making accommodation decisions? Discuss how the “average values” may differ between different communities.
 - Provide students with the headings for an “Accommodation Chart” and provide resources for the completion of the chart. Suggested headings are: Type of Accommodation, Advantages, Disadvantages, and Cost Structure.
 - Present the following scenario: You have been discussing attending college far from home with your parent/guardian(s). They have asked you where you are going to live. You suspect that if you present solid arguments for a specific accommodation choice that you have researched, they will assist you financially. Write them a letter to communicate three specific accommodation options, and your choice, with justification.
 - Provide students with the assessment rubric for the assignment (Appendix 1.1).

Student Activity

- Discuss and explore accommodation options should you leave home to go to college.
- Identify and investigate the details and costs of five accommodation choices using resources from a college community. After communicating these investigated alternatives to the class, participate in a class discussion to classify these alternatives.
- Based on research by students in the class, determine the average monthly costs of these accommodation types for this college community.
- Use this information as you develop a chart listing these accommodation types and citing the advantages, disadvantages, and approximate cost structures involved with each.
- Through a written letter of justification to your “parent(s)/guardian,” outline the details of three accommodation alternatives and request your parents’ financial support for one of these choices.

Assessment & Evaluation of Student Achievement

- Assess students’ Knowledge/Understanding by the quality of the information in their “Accommodation Chart”.
- Assess Communication and Knowledge/Understanding by evaluating the “letter to the parents” using the provided rubric (see Appendix 1.1).
- Assess students’ ability to work independently by observing the extent to which they independently retrieve information and complete the accommodation chart using provided resources.

Accommodations

Students with poor handwriting are encouraged to type their letter to their parents.

Resources

<http://osca.ouac.on.ca/res-c.htm> for residence and housing information for Ontario colleges
www.relocatecanada.com for the National Guide for People Relocating
www.acaato.on.ca/colleges.html for addresses and phone numbers for all of Ontario’s colleges
www.lawsmart.com/landlord.html or www.ilrg.com/forms/lease.html for a tenancy agreement
<http://www.realtylocator.com/inforesourcelocator.nsf/indexpagedisplay/resources!Opendocument> for real estate information around the world

Activity 2: Are You Ready to Buy a Home?

Time: 225 minutes

Description

Students learn terminology associated with mortgages and develop an understanding of how interest is calculated on mortgages in Canada. Graphing or financial calculator technology is used to determine mortgage payments, while varying the compounding period. Students use this knowledge to participate in a simulation where they verbally justify to their parents (as a follow-up to Activity 1) that they are prepared to be a homeowner.

Strand(s) & Learning Expectations

Strand(s): Personal Finance Decisions

Overall Expectations

CIV.03 - demonstrate an understanding of the effect on investment and borrowing of compounding interest.

Specific Expectations

CI3.05 - identify the common terminology and features associated with mortgages;

CI3.06 - describe the manner in which interest is usually calculated on a mortgage (i.e., compounded semi-annually but calculated monthly) and compare this with the method of interest compounded monthly and calculated monthly.

Planning Notes

- Prepare “e-mail from the parents” (see Appendix 2.1) to introduce the lesson, and provide structure to students for further research.
- Gather resources from banks, credit unions, mortgage brokers, etc. that list information for consumers on mortgages. Most of these will include a glossary which should include the following key terms: equity, mortgagor, mortgagee, appraisal, term, principal, pre-approval, conventional mortgage, closing date, interest rate, mortgage, payment frequency, amortization, offer to purchase, portability, Canadian Mortgage and Housing Corporation (CMHC), closing costs, land transfer tax, down payment, legal fees, etc.
- Prepare to deliver a brief lesson on the basic concept of compounding, as required.
- Prepare worksheet (see Worksheet 1) for students to determine monthly payments for various mortgages, using both monthly and semi-annual compounding. The use of the TVM Solver or the equivalent of any graphing or financial calculator is suggested.
- Prepare index cards with three different scenarios. Each scenario includes a home price, down payment amount, mortgage interest rate, and amortization period. There should be a set of scenarios for each group of three students in the class. These scenarios form the basis for the parent-student role-play that completes this activity.
- Prepare “Student’s Understanding of Mortgages” assessment tool (see Appendix 2.2).
- Graphing or financial calculators are required for this activity. Student Worksheet 1 can be readily modified for use with any graphing or financial calculator. Consult your owner’s manual for appropriate symbols.

Teaching/Learning Strategies

Teacher Facilitation

Day 1:

- Provide students with a hardcopy of the “e-mail” response sent by their parents as a result of their letter in Activity 1 (see Appendix 2.1).
- Use this e-mail as a vehicle for communicating mortgage terminology to students that they will be required to define in their own words. They are required to define all of the underlined words in the letter. Provide resources (bank pamphlets, flyers, dictionary) for students to research definitions.
- As a preparation for the upcoming “simulation,” demonstrate the use of the graphing or financial calculator to calculate monthly payment. Explain the symbols used on the calculator as they pertain to the mortgage terminology definitions that the students have already explored. When compounding period is explained, pose the question to students as to what kinds of compounding will result in paying less interest.

Day 2:

- After students have predicted which compounding periods result in lower payments, go through calculations together to (a) calculate monthly payments, and (b) illustrate that semi-annual compounding results in lower payments than monthly compounding. Let them explore this on their own and come to their own conclusion. It would be more meaningful to them this way.
- Students may wish to explore various compounding periods other than monthly or semi-annual, but it should be made clear that ALL mortgages in Canada have interest that is compounded semi-annually but often paid monthly.
- Assign Worksheet 1.

Day 3:

- As a follow-up to the parent letter, explain that students are to participate in an activity to “simulate” a conversation with their parent/guardian(s). Working in a group of three, each student has the opportunity to convince the other two “parents” that they are “home-ownership worthy.” Their arguments are based on the information provided in their individual scenario card (each student in the group has a different set of figures). When students pose as “parents”, they provide feedback on the student’s arguments using a provided assessment tool (see Appendix 2.2).

Student Activity

In response to the letter you wrote in Activity 1, your parents have written you a detailed e-mail which includes a great deal of mortgage terminology. You learn what these terms mean, and work through sample mortgage calculation problems using a graphing or financial calculator. You will write a quiz to show what you’ve learned. This work prepares you for a role play activity where you convince two other students (posing as your parent/guardian(s)) that you are knowledgeable of and ready for home ownership. Your “parents” will then give you feedback on your ability to communicate your understanding.

Student Worksheet 1

1. List the mortgage term that relates to each of the following symbols:

N=	I%=
PV=	PMT=
FV=	P/Y=
C/Y=	

2. Complete the following chart using a calculator with financial functions.

A	For a mortgage amount of \$105 000 at 8%/a interest amortized over 25 years				
	N=	I%=	PV=	FV=	P/Y=
	Compounded Semi-Annually C/Y= PMT=			Compounded Monthly C/Y= PMT=	
B	Home purchased at \$140 000 with a down payment of \$20 000 at 7.4%/a interest amortized over 25 years.				
	N=	I%=	PV=	FV=	P/Y=
	Compounded Semi-Annually C/Y= PMT=			Compounded Monthly C/Y= PMT=	
C	Home purchased at \$125 000 with a down payment equal to 25% of the purchase price at 10.25%/a interest amortized over 20 years.				
	N=	I%=	PV=	FV=	P/Y=
	Compounded Semi-Annually C/Y= PMT=			Compounded Monthly C/Y= PMT=	

- What should C/Y always be set at when working with mortgages in Canada?
- Calculate the monthly payments for each of the following mortgages, assuming semi-annual compounding:
 - \$87 500 mortgage @ 9.85%/a amortized over 25 years
 - \$155 700 mortgage @ 8.90%/a amortized over 20 years, etc.

Assessment and Evaluation of Student Achievement

- Assess students' Knowledge/Understanding by using the feedback from students in the simulation (Student's Understanding of Mortgages Assessment Tool)
- Evaluate students' Knowledge/Understanding of mortgage terminology and calculations using a quiz.
- Assess students' initiative observing their participation in simulation (as both student and parent).

Accommodations

Students may be provided with the definitions of mortgage terms in list form.

Resources

Information on mortgage terminology can be found at the following sites:

www.bmo.com/ (Bank of Montreal)

www.canadatrust.com (Canada Trust)

www.cibc.com (CIBC)

www.royalbank.com (Royal Bank Financial Group)

www.tdbank.ca/ (Toronto Dominion)

www.cmhc-schl.gc.ca (CMHC Canada Mortgage and Housing Corporation)

www.mortgagecentre.com/enter.cfm (The mortgage centre)

www.canmortgage.com/ (Canada Mortgage)

For help with the TVM solver function of the TI83+

www.ti.com/calc/docs/act/83finch2.htm

For assistance with other brands of calculators:

CASIO – <http://www-personal.umich.edu/~hjo/casio/>

HP: <http://galaxy.einet.net/hytelnet/BBS009.html>

SHARP: call 1-800-BE-SHARP to order a calculator manual

TEXAS INSTRUMENTS:

<http://navigation.helper.realnames.com/framer/1/112/default.asp?realname=Texas+Instruments+Calculators&url=http%3A%2F%2Fwww%2Eti%2Ecom%2Fcalc%2Fdocs%2Fcalchome%2Ehtml&frameid=1&providerid=112&uid=30005189> for calculator guidebooks

For a mortgage amortization calculator and other information for this unit
<http://finance.canada.com/bin/putform?Type=Calculator>

Activity 3: Table Talk

Time: 300 minutes

Description

Students learn to complete calculations related to annuities and effective interest rates to prepare for the game “Table Talk.” In this game, students make calculations necessary to fill in incomplete monthly payment and monthly interest tables. Students develop an understanding of mortgage interest when they form and test a hypothesis for the total amount of interest paid over the life of a specific mortgage. This understanding is reinforced when they learn to interpret and generate amortization tables.

Strand(s) & Learning Expectations

Strand(s): Personal Financial Decisions

Overall Expectations

CIV.03 - demonstrate an understanding of the effect on investment and borrowing of compounding interest.

Specific Expectations

CI3.07 - generate an amortization table for a mortgage, using a spreadsheet or other appropriate software;
CI3.08 - calculate the total amount of interest paid over the life of a mortgage, using a spreadsheet or other appropriate software, and compare the amount with the original principal of the mortgage or value of the property.

Planning Notes

- Prepare overhead of “Table Talk” Monthly Interest table (see Teacher Facilitation: Interest on \$1.00 Compounded Semi-annually)
- Prepare overhead of “Table Talk” Monthly Payment table (see Teacher Facilitation: Blended Monthly Payment Table for a loan of \$1 000)
- Tables reflecting the “Interest on \$1.00 Compounded Semi-annually” will be required.
- Prepare overhead of complete amortization table.
- Prepare worksheet of incomplete amortization tables (Student Worksheet 1).
- Secure the use of one or more computers so that spreadsheet software can be employed. Be prepared to provide review on basic spreadsheet use, as needed.
- Local resources regarding homes available for sale will be required (e.g., Newspapers, Internet, etc.)

Teaching/Learning Strategies

Teacher facilitation

Day 1:

- Review calculations involving annuity formulas and effective interest rates, as needed.
- Introduce the game “Table Talk” and divide the class into two groups.

- Present the first “Table Talk” game board on the overhead. It reflects the interest on \$1.00 compounded semi-annually. A sample of a completed game board is provided below. When used as a game board on the overhead, this table should appear mostly blank. The figures below can serve as your answer key.

Interest on \$1.00, Compounded Semi-Annually

Time	6%	6.5%	7%	7.5%	8%
1 day	.000161979	.000175265	.000188519	.00201741	.000214931
1 week	.0011375235	.001230874	.001324008	.001416925	.001509627
1 month	.004938622	.005344740	.005750040	.006154524	.006558197

Sample Calculation (6% for 1 month)

$$(1.03)^2 = (1+i)^{12}$$

$$1+i = (1.03)^{2/12}$$

$$i = 0.004938622$$

This means that for any mortgage, one month of interest at 6% compounded semi-annually would be equal to (0.004938622) x the outstanding principal.

For example: A person’s outstanding balance on their mortgage (at a 6% rate) is \$87 415.07. The interest portion of their payment for the next month would be: \$87 415.07 x 0.004938622 = \$431.71.

It should be noted that from the time periods included in this table, the “1 month” time is the only one used in amortization tables and is used most often. Time periods of one day and one week are used to determine interest penalties or interest charges for periods shorter than one month.

- Complete a calculation for one of the boxes on the game board as a class.
- Identify a team spokesperson to select a “box” for which the team would make the calculation.
- All members of the team must reach a consensus on the answer before the answer is presented.
- The team colour is used to shade in each box that is calculated correctly.
- Each time a team makes three calculations (diagonally, horizontally or vertically) a point is earned.
- When the first game board is filled in, continue scoring using the “Table Talk” blended monthly payment table. The completed table (below) is to be used as an answer key; the game board presented to students is to be mostly blank.

Blended Monthly Payment Table (for a loan of \$1000)

Amortization	6%	7%	8%	9%	10%
20	7.12189	7.69311	8.28358	8.89190	9.51665
25	6.39807	7.00416	7.63214	8.27978	8.94488
30	5.94824	6.58604	7.24712	7.92833	8.62668

Sample Calculation (for 10% interest, amortized over 20 years)

Solve for PMT in the formula for the present value of an ordinary simple annuity.

$$PV = PMT \left[1 - (1+i)^{-n} / i \right]$$

Because interest is compounded semi-annually and payments are made monthly, we can not use this formula until we first make the compounding periods the same. To do this, we calculate the effective monthly interest rate for 10% compounded semi-annually.

$$(1.05)^2 = (1+i)^{12}$$

$$i = .0081648461$$

We can then use this figure in the simple annuity formula $PV = PMT [1 - (1+i)^{-n} / i]$.

$$PV = 1000, i = .0081648461, n = 20 * 12 = 240$$

$$\{ PMT = 9.51665$$

- Complete a calculation for one of the game boxes as a class. The winning team is the one with the greatest number of “tic-tac-toes” (three-coloured squares in a row).

Day 2:

- Present this “interesting scenario” to the class: Estimate how much total interest is paid on a mortgage of \$120 000, at an interest rate of 7% given that interest is compounded semi-annually, amortized over 25 years.
- Record students’ estimates on the board to be revisited later.
- Display and explain a complete amortization table (as generated by a spreadsheet) for this example.
- Review spreadsheet software by presenting the formulas that were required in the spreadsheet to generate this amortization table.
- Distribute Worksheet 1 to provide opportunity for students to make amortization table calculations.

Day 3/4:

- Provide resources for students to investigate homes that are available for sale in their community. Instruct students to select one home they would like to purchase in the future (in a price-range consistent with their anticipated income established in unit one). The price of this home is to be used as the mortgage amount.
- Provide three specific mortgage profiles for students to use (i.e., Interest rate 8.5%, amortization= 20 years, etc.) Instruct students to apply their understanding of amortization and spreadsheet software to generate an amortization table for each mortgage profile.

Student Activity

By participating in the game “Table Talk,” you learn how to calculate the figures found in various mortgage calculation tables. Using these tables in your calculations, you learn to interpret, explain, and complete amortization tables. You demonstrate this understanding through the completion of a worksheet.

Student Worksheet 1

1. Determine the monthly payments using a graphing/financial calculator or blended monthly payment tables for the following:
 - a) \$75 000 mortgage at 10.25%/a interest amortized over 25 years
 - b) \$97 400 mortgage at 9.5%/a interest amortized over 20 years
2. Using an interest table for \$1 compounded semi-annually, determine the interest factor for a month and a week for the following annual mortgage interest rates:
 - a) 8.75%
 - b) 14.25%
 - c) 12.5%
3. In each case below, determine the monthly payment and the appropriate interest factor, then enter either “numerical data” or “formulas” to complete the first four rows of each amortization table (DO NOT complete the calculations by hand ...use formulas)
 - a)

A	B	C	D	E	F
1	\$70 000 mortgage @ 7%/a interest amortized over 25 years				
2	Interest factor is _____				
3					
4	Payment	Monthly	Interest	Principal	
5	No. Payment	Portion	Portion	Remaining	
6	0				
7	1				
8	2				
9	3				

Now that you have a better understanding of the total amount of interest paid during the life of a mortgage, you will be required to create specific mortgage amortization tables based on the purchase of a home in your community or your future college community.

Assessment & Evaluation of Student Achievement

- Use student Worksheet 1 to assess students' Knowledge/Understanding and Application of spreadsheet and amortization table calculations.
- Assess Application by students' ability to successfully produce amortization tables for their chosen home.
- Assess teamwork by observing students' interaction with classmates during the "Table Talk" game.

Accommodations

Visually impaired and/or learning disabled students may require an enlarged hardcopy of the game boards.

Resources

For financial calculators on the Internet go to:

http://www.financenter.com/calculate/all_calculate.fcs

Activity 4: How'd They Do That?

Time: 300 minutes

Description

Students explore various mortgage features (i.e., payment frequency, amortization period, alternative payment options, interest rates, etc) using appropriate technology. Total interest will be compared when each option is varied, as well as total time required to pay off the mortgage. Students analyse how these different factors influence the total interest paid and the time required to "pay off" the mortgage.

Strand(s) & Learning Expectations

Strand(s): Personal Finance Decisions

Overall Expectations

CIV.03 - demonstrate an understanding of the effect on investment and borrowing of compounding interest;

PFV.04 - demonstrate the ability to make informed decisions involving life situations.

Specific Expectations

CI3.09 - compare the effects of various payment periods, payment amounts, and interest rates on the length of time needed to pay off a mortgage;

CI3.10 - demonstrate, through calculations, using technology, the effect on interest paid of retiring a loan before it is due;

PF4.05 - explain the process used in making a decision and justify the conclusions reached.

Prior Knowledge & Skills

- Development of amortization tables
- Application of interest and payment tables in developing spreadsheet formulas
- Use of graphing or financial calculators

Planning Notes

- Computers are required for a portion of this activity, and graphing or financial calculators are useful at all stages.
- If spreadsheets are unavailable, options include using a template of a spreadsheet to allow for the set-up of an amortization table, or a data projector.

- Create a generic amortization table spreadsheet template to be made available to students.
- The classroom is divided into five stations, as described in the chart below. The equipment for each station is to remain at each station throughout the activity.

Station Number	To compare the effects of ...	Requirements
1	Varying Payment Frequencies (monthly vs. weekly vs. accelerated weekly)	Graphing/financial calculator for every student at this station.
2	Varying Payment Frequencies (monthly vs. semi-monthly vs. bi-weekly)	Graphing/financial calculator for every student at this station.
3	Varying Amortization Period (20 vs. 25 vs. 30 years)	Graphing/financial calculator for every student at this station.
4	“Lump Sum” Payments	Spreadsheet Software with file “station4”
5	Payment Size (constant vs. payment increasing by a percentage)	Spreadsheet Software with file “station5”

- For stations 1-3, have the graphing/financial calculators set up at the appropriate screen to perform required calculations.
- For station 4, prepare a spreadsheet amortization table for an \$85 000 mortgage at 7.9%/a interest, amortized over 25 years, including a calculation for total interest. Save as “station4.” The same file may be saved at station 5, but saved as “station5.”
- Worksheets 1 and 2 are designed to be adapted to the graphing/financial calculator being used. See the owner’s manual of the specific calculator being used for additional information.

Teaching/Learning Strategies

Teacher Facilitation

Day 1:

- Provide two scenarios, as illustrated below, to show how a more expensive home may end up costing less over the life of a mortgage, based on mortgage features that were utilized.
Example 1: \$99 000 home, \$10,000 down payment, 8.75% interest, 25 year amortization, paid monthly. This leads to a monthly payment of \$722.34, and approximately \$226 700 paid over the life of the mortgage
Example 2: \$145 000 home, \$10 000 down payment, 7.5% interest, 20-year amortization, pay accelerated weekly. This leads to a monthly payment of \$1078.11, and an accelerated weekly payment of \$269.53. Also, with this scenario, the mortgagor is allowed to increase their weekly payment by 20% starting the second year of the mortgage. Approximately \$221 979 is paid over the life of the mortgage
- Initially, share only the house price, and total money spent over the life of the mortgage. Have students brainstorm how this could be possible.
- Ask students to brainstorm the factors that influence the total cost of a mortgage. Guide students towards practical approaches (using mortgage features) that may be used to lower mortgage costs. Allow students to explore these approaches by changing the information on the spreadsheet template that has been prepared by the teacher.

-
- Demonstrate the feature of the graphing or financial calculator which allows you to determine the number of payment periods based on a given amortization period and payment frequency (see Student Worksheet 1).
 - Demonstrate the calculation of payments for various payment frequencies based on the monthly payment (see Student Worksheet 1).
 - Distribute Student Worksheet 1 for completion.

Day 2/3:

- Prepare students for upcoming station activity by demonstrating examples using a graphing or financial calculator or spreadsheet as a demo. Using a constant mortgage amount and interest rate, complete the following as a class:
 - Example 1** (to prepare for stations 1 and 2)
Determine the monthly payment and total amount paid (Payment x N); determine weekly payment (monthly * 12 / 52), and determine “N” using a graphing/financial calculator, and calculate total paid (weekly payment x N). Compare the total amounts paid.
 - Example 2** (to prepare for station 3)
Determine monthly payment using 25 year amortization, and calculate total amount paid over 300 payments; Determine monthly payment using 20 year amortization, and total amount paid over 240 payments. Compare total amounts paid.
 - Example 3** (to prepare for station 4 and 5)
Using a spreadsheet, illustrate how to calculate total interest for a given mortgage by adding all values in interest column. Determine total paid by adding principal amount (and down payment if known) to this total. Demonstrate how to increase payment by 5% (payment * 1.05) and enter this as the new payment illustrating the situation where a mortgagor may increase their payments. Demonstrate again how to total the interest paid, highlighting the fact that it will now take less time to pay off the mortgage, and only those rows with positive interest values should be added. Re-calculate the new total amount paid, and compare to the original total.
- Set up the classroom with five types of stations (2 of each). See Planning Notes.
- Provide students with student Worksheet 2 to facilitate station work.
- After station work, re-group students and discuss conclusions that were drawn, as a class, to insure correct conclusions have been drawn.

Day 4:

- Challenge students to a friendly exploration to see which group can find conditions (within certain parameters) that will minimize the costs on a \$150 000 home. Suggested parameters are:
 - can use an interest rate $\frac{3}{4}$ % less than any advertised rate they can find
 - can use either: lump sum payments (up to 10% of the principal remaining) once/year OR several lump sum payments totalling no more than 10% of the principal at the start of the year OR increasing the size of the monthly payment (no more than double)
 - can use other mortgage features.
- To apply these conclusions, each group will be given two homes with different prices (keep within \$30 000). Assuming both homes were purchased using the same down payment, students are to vary mortgage features in each case to demonstrate how it is possible to pay less in total for the more expensive home than for the cheaper one. Remind students they may vary interest rates (no more than 1.25% difference as a guide), amortization period, payment frequency, and payment amounts. When complete, they should be able to describe the payment plans established for each home, along with the total costs for each (see Student Worksheet 3).

Student Activity

Brainstorm the ways that the total amount paid for a home varies depending on the mortgage features selected. Review the use of a graphing or financial calculator to determine unknown values such as payment, number of payment periods, etc. by completing Student Worksheet 1.

Student Worksheet 1 – Determine missing values using graphing or financial calculator (students are to complete columns 2 and 3). Additional examples may be added to assess Knowledge/Understanding.

Given Information	Calculator Values	Missing Information
\$85 000 mortgage @7.6% interest amortized over 20 years	N= I%= PV= PMT= FV= P/Y= C/Y=	Monthly payment = Semi-monthly payment =
\$115 000 mortgage @9.35% interest amortized over 25 years	N= I%= PV= PMT= FV= P/Y= C/Y=	Monthly payment = Accelerated weekly payment = Number of payments using accelerated weekly payment =

Sample Worksheet 2 How Do The Features Affect Total Cost?

Use \$85 000 mortgage @ 7.9% interest amortized over 25 years (unless told otherwise) N = I% = PV = PMT = ? FV = P/Y =12 C/Y =2			
Station 1 – compare monthly/weekly/accelerated -weekly payments with TI83	Monthly payment = _____ Total Paid = PMT x N = _____	Weekly Payment = _____ Using weekly PMT, value for “N” = _____ Total Paid = PMT x N = _____	Accelerated Weekly Payment = _____ Using accelerated weekly PMT, value for “N” = _____ Total Paid = PMT x N = _____
Conclusion from Station 1 –			
Station 2 – compare monthly/semi-monthly/bi-weekly payments with TI83	Monthly Payment = _____ Total Paid = PMT x N = _____	Semi-Monthly Payment = _____ Using semi-monthly PMT, value for “N” = _____ Total paid = PMT x N = _____	Bi-weekly payment = _____ Using bi-weekly PMT, value for “N” = _____ Total paid = PMT x N = _____
Conclusion from Station 2 –			
Station 3 – Compare 25 year amortization to 20 or 30 year amortizations using TI83	25 year: N = _____ Monthly PMT = _____ Total Paid = PMT x N = _____	20 year: N = _____ Monthly PMT = _____ Total Paid = PMT x N = _____	30 year: N = _____ Monthly PMT = _____ Total Paid = PMT x N = _____
Conclusion from Station 3 –			

Station 4 – Compare constant payments to “lump-sum” payments using a spreadsheet (for example add lump sum payments on every “anniversary date” of mortgage)	(Open file “station4”) Monthly PMT = _____ Total Interest = _____ Total Paid = _____ Principal + Interest = _____	-On every 12th payment, increase payment on spreadsheet by \$1500 (i.e., at payment # 12, 24, 36, etc.) New total Interest paid = _____ New total Paid = _____	-On every 12th payment, increase payment on spreadsheet by \$2500 -New total Interest paid = _____ New total paid = _____ (Close file. DO NOT save changes)
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Conclusion from Station 4 –

Station 5 – Compare constant payments to increasing payments by a percentage (for example, increase payments 2 years into the mortgage)	(Open file “station5) Monthly PMT = _____ Total Interest = _____ Total Paid = _____ Principal + Interest = _____	Increase PMT by 10% New PMT = _____ In spreadsheet, change all payments to new increased PMT starting at payment 24 New Total Interest = _____ New Total Paid = _____	Increase original PMT by 15%: New PMT = _____ In spreadsheet, change all payments to new increased PMT starting at payment 24 New Total Interest = _____ New Total Paid = _____
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Conclusion from Station 5 –

Student Worksheet 3

Two homes are purchased at \$85 000 and \$120 000, both using down payment of \$10 000. Demonstrate how mortgage features may be selected so that the total amount paid for the \$120 000 home will be less than the total amount paid for the \$85 000 home. Any or all mortgage features may be different, but you may not vary the interest rate by more than 1.25%.	
\$85 000 Home -Interest Rate: -Amortization Period: -Payment Frequency: -Payment Amount: -Changes to Payment Amounts: Total Interest Paid: Total Principal Paid: Total Paid Altogether:	\$120 000 Home -Interest Rate: -Amortization Period: -Payment Frequency: -Payment Amount: -Changes to Payment Amounts: Total Interest Paid: Total Principal Paid: Total Paid Altogether:

Assessment & Evaluation of Student Achievement

- Assess Application by students' ability to use technology to complete the missing values at each station.
- Assess students' Problem Solving by their ability to draw conclusions or trends for each of the varying mortgage features (Summative Assessment).
- Assess Thinking/Inquiry/Problem Solving based on their arguments and justification presented as a result of their exploration associated with Student Worksheet 3.
- Assess work habits as a result of their completion of Student Worksheet 3 and the justification of their arguments.

Accommodations

As indicated in students' IEPs, students with learning disabilities may require more time to complete this activity and to make their own conclusions. The teacher may wish to assign fewer questions.

Activity 5: Summative: Check it Out!

Time: 225 minutes

Description

Students develop a checklist designed to help individuals decide whether to rent or buy. As a class, students explore the process of making an accommodation decision and the various organizational tools that may be used (i.e., tables, lists, etc.) to support such a decision. Accommodation alternatives for specific scenarios are investigated and compared. Students make and present accommodation decisions on these scenarios.

Strand(s) & Learning Expectations

Strand(s): Personal Finance Decisions

Overall Expectations

PFV.02 - determine, through investigation, the relative costs of renting an apartment and buying a house;
PFV.04 - demonstrate the ability to make informed decisions involving life situations.

Specific Expectations

PF2.02 - compare the costs of maintaining an apartment with the costs of maintaining a house;
PF2.03 - compare the advantages and disadvantages of renting accommodation with the advantages and disadvantages of buying accommodation;
PF2.04 - summarize the findings of investigations in effective presentations, blending written and visual forms;
PF4.03 - summarize the advantages and disadvantages of the alternatives to a decision using lists and organization charts;
PF4.04 - compare alternatives by rating and ranking information and by applying mathematical calculations and analysis, as appropriate (e.g., calculating loan payments or interest rates; constructing graphs or tables), using technology;
PF4.05 - explain the process used in making a decision and justify the conclusions reached.

Planning Notes

- Prepare overheads/visual aids that display the use of tables, pros/cons lists, charts and graphs as a support for decision-making.
- The use of graphing or financial calculators and spreadsheet software is required.

-
- Prepare two sets of family scenario cards: one set where the families would likely be recommended to buy; another set where the families would likely be recommended to rent. Renting scenarios may include situations where a family will stay for a limited time period; an older couple who cannot maintain a home; a student who does not have the time to maintain a home, or possibly a family or person that cannot afford the costs of home ownership.
 - Community resources on homes for sale and rental opportunities are required.
 - Availability of the Internet is also desirable.
 - Poster board, markers, and other supplies for students to create a visual display are required.

Teaching/Learning Strategies

Teacher Facilitation

Day 1:

- Instruct pairs of students to generate ideas for a two-column checklist. “You Should Buy If... and You Should Rent If” checklist. Completion of the checklist would give guidance to an individual making accommodation decisions.
- Encourage students to share their ideas and develop one list as a class.
- During the discussion, relate to students some general information regarding the financial requirements for mortgage approval. You may consider presenting specific financial ratios (Total Debt Service Ratio [TDS]: the ratio of all monthly expenses to gross monthly income should not exceed 40% and/or Gross Debt Service Ratio [GDS]: the ratio of mortgage, taxes and heating to gross monthly income should not exceed 32%).
- Present the class with a family scenario. For example: The Jones family has a total income of \$85 000 and is moving to your area. They intend to stay here for some time, given the fact that they have family here. They have about \$5000 in savings. The family has two kids, aged 15 and 17. (**Note:** add enough information to allow students to make a decision)
- Encourage students’ input as to whether the family should rent or buy. Incorporate the checklist created by the class into the discussion.

Day 2:

- Time permitting, work through another scenario as a class to reinforce the process of problem solving: I lived in a condo and paid \$1000 per month. I stayed there for 4 years. If I had a down payment for a house, should I have bought? What would I have to show for it? What equity would I have had today? What if I had invested that down payment and lived in the condo? What would I have in the bank?
- Present the various lists and organization charts that can be used to organize information when making decisions: advantages/disadvantages chart or pros and cons list, concept maps and mathematical calculations where appropriate.
- Incorporate these tools into the discussion, reinforcing their importance in the decision-making process.
- Emphasize the decision-making process and the importance of justification wherever possible.

Day 3/4:

- Present each student with two scenario cards (one renting, one buying).
- Instruct students to research accommodation in their own community for the renting family. Students are to thoroughly explore and present two accommodation alternatives that best meet the needs of this family. They are to present a final recommendation for just one of these two (with justification). The picture of the accommodation and/or the advertisement is required as part of the project.

-
- The same process is to be completed for the buying family scenario, although specific details from mortgages available from community financial institutions will need to be used. Students are to submit an amortization table based on monthly payments, 25-year amortization, and interest rates posted in local newspapers. They are also to explore realistic alternatives that may enable this family to reduce the total interest paid. This may include: a lower interest rate, different amortization period, different payment frequencies, and/or altering payment amounts. Students are to justify why their chosen alternatives are, in fact, realistic for the family in question. Using technology wherever appropriate, students are to demonstrate the amount of interest that this family could save as a result of the students' suggestions.

Student Activity

With a partner, develop a checklist that would help people decide if they should rent or buy. Working together with the class, create a final usable "checklist". Apply this checklist to two specific family scenarios. Using real housing data in the community, select two viable accommodation alternatives for each family, then use mathematical reasoning (with justification) to make one recommendation for each family. Apply mathematical calculations (total monthly payment, total interest paid, variations of mortgage features) and the use of technology the analysis of each alternative. Using lists and organization charts, as well as amortization tables, you develop a visual presentation of the recommendation to each family.

Assessment & Evaluation of Student Achievement

Use the rubric (see Appendices) to evaluate each students' Problem Solving and Communication skills independently.

Learning Skills

Assess students' organization by their ability to organize their report and visual presentation.

Accommodations

Additional scaffolding (such as structured worksheets and/or specific suggestions for strategies to lower interest costs) for this final project may be required. Arrange for peer assistance for students with reading or writing disabilities when preparing the visual presentation of renting versus buying.

Resources

For a home financing calculator go to:

<http://finance.canada.com/bin/putform?Type=Calculator>

Appendix 1.1

Rubric for the Assessment of Students' "Letter to Parents"

	Level 1 (50 – 59%)	Level 2 (60 – 69%)	Level 3 (70 – 79%)	Level 4 (80 – 100%)
Knowledge/ Understanding Proposal detail	- alternatives provide limited detail	- alternatives provide some detail	- alternatives provide considerable detail	- alternatives provide thorough detail
Accuracy of financial information for alternatives	- limited accuracy	- some accuracy	- considerable accuracy	- a high degree of accuracy
Communication Use of correct mathematical terminology	- limited correctness	- some correctness	- considerable correctness	- a high degree of correctness
Mathematical and written justification	- limited mathematical/ written justification	- some mathematical/ written justification	- considerable mathematical/ written justification	- convincing mathematical/ written justification

Note: A student whose achievement is below level 1 (50%) has not met the expectations for this assignment or activity.

Appendix 2.1

Parent/Guardian Letter

Thanks for the note about where you might like to live. It's obvious from all of the work you've done that you're really growing up.

However, you mentioned the possibility of "buying" a home. Are you sure you're ready for such a big commitment? I mean, when we were your age, we knew nothing about buying a house. We didn't know about mortgage brokers or that you could go from bank to bank trying to get the best interest rate.

We'd love to help you out with buying a home, if it's the best choice, but we just don't want you to make the same mistakes that we did. If we had played our cards right, we could have saved a bundle in interest. We didn't make any extra payments, we just paid the same monthly payment every month for 25 years. We were never told about things like: double up or lump sum payments or different payment frequencies. We didn't even know there were amortization periods other than 25 years. Apparently, there's some new type of calculator that helps you make all kinds of calculations with mortgages.

Also, if we had realized all of the closing costs we would need to pay (in addition to our down payment) such as legal fees, and land transfer tax, we would have avoided many problems. All we were concerned with was "Can we afford the monthly payment?" When the furnace broke down, the unanticipated maintenance costs caused us to have to use milk crates and the "floor" as our furniture for a while.

If you can prove to us that you're ready for this commitment and that you're knowledgeable of mortgages and home ownership issues, we will help you out. (Of course, we're going to need to know some numbers—like how much you're going to need up front). Let's meet so that we can talk about these things further.

Appendix 2.2

Assessment Tool for Student's Mortgage Understanding

Use the following form to assess _____ as they present to you, the parent, their understanding and knowledge of home ownership. It is very important that you read this over entirely before the student proceeds as you play the role of the "parent". Also, ensure that you assess fairly and honestly. It will be very helpful to include detail where space is provided. Remember that YOU will be evaluated on your thorough completion of this page.

1. Check off all mortgage terminology used in the role-play and add any terms that are used but not listed here.

Accelerated payment	Interest	Monthly Payment
Amortization period	Interest Rate	Mortgage Broker
Closing costs	Land Transfer Tax	Payment Frequency
Double-Up Payment	Legal Fees	Weekly Payment
Down Payment	Lump Sum Payment	_____
_____	_____	_____

For questions 2-6, circle the best response and add extra information if possible.

2. Were the terms used in the proper context? (i.e., used properly in sentences, not just "listed")

Never	Not often at all	Sometimes	Usually	Often	All the time
0	1	2	3	4	5

Details: _____

3. Did it appear from the explanations given that the student understands these terms?

Not at all	Just a little	Mostly	Almost Totally	Completely
0	1	2	3	4

Details: _____

4. a) Was the home price given? Yes No

1 0

- b) Was the down payment given? Yes No

1 0

- c) Was the monthly payment given? Yes No

1 0

- d) Was the total of all closing costs given? Yes No

1 0

- e) Was there an explanation for the values above?

None	Some, not too clear	Most, fairly clear	All clearly explained
0	1	2	3

5. As the "parent", are you convinced that your child understands what they are getting into and deserve your support?

No way, wouldn't lend them a nickel	Sort of, but I'd still worry	Seems to understand	Understand clearly and is ready to be a homeowner
0	1	2	3

Appendix 5.1

Rubric to Evaluate Student's Accommodation Recommendation

	Level 1 (50 – 59%)	Level 2 (60 – 69%)	Level 3 (70 – 79%)	Level 4 (80 – 100%)
Communication - use of terminology	- limited use of appropriate mathematical and mortgage terminology	- some use of appropriate mathematical and mortgage terminology	- considerable use of appropriate mathematical and mortgage terminology	- consistent use of appropriate mathematical and mortgage terminology
- clarity of presentation of alternatives	- presents alternatives for reducing total mortgage costs with limited clarity	- presents alternatives for reducing total mortgage costs with some clarity	- presents alternatives for reducing total mortgage costs with considerable clarity	- clearly presents alternatives for reducing total mortgage costs with a high degree of clarity
Problem Solving - reasoning	- presents argument and refers to amortization table to support argument with limited effectiveness	- presents argument and uses amortization table to support argument with some effectiveness	- presents argument and uses amortization table to support argument with considerable effectiveness	- presents argument and uses amortization table to support argument with a high degree of effectiveness
- reasonableness of recommendation	- recommendation offers limited realism as to the given family scenario	- recommendation is somewhat realistic for the given family scenario	- recommendation is considerably realistic for the given family scenario	- recommendation is highly realistic for the given family scenario

Note: A student whose achievement is below level 1 (50%) has not met the expectations for this assignment or activity.

Unit 7: Managing Your Money

Time: 17 hours

Description

The impact of various factors on household budgeting is examined. Students investigate types of retailing (retail store, catalogue, Internet, etc.) and explore the alternatives to make a purchase decision. Currency conversions are analysed and the impact of foreign exchange rates on the purchases and/or travel plans of the consumer is considered. This leads to an examination of credit card/debit card features and the short-term and long-term effects of carrying credit card debt. Students apply this information, together with the income potential expected from their chosen career path, to design and justify budgets for a variety of family groupings. A variety of technological tools, including spreadsheets and the Internet facilitate explorations in this area.

Activity	Time	Expectations	Assessment	Tasks
1. Wide World of Money	225 min	PFV.04, PF4.07, CGE5a	Knowledge/ Understanding Application	Calculate currency exchange; currency exchange as a factor in investment decisions
2. The Informed Consumer	225 min	PFV.04, PF4.06, CGE5a, CGE4f	Thinking/Inquiry/ Problem Solving Communication	Compare types of retail selling and sales incentives in the context of making a household purchase
3. A Credit Concern	150 min	CIV.03, CI3.11, CI3.12, CGE7b	Thinking/Inquiry/ Problem Solving Communication	Examine credit card/debit card features; analyse the effects of delayed payment on credit card debt
4. Building a Budget	150 min	PFV.03, PF3.01, PF3.02, PF3.03, CGE2b, CGE2c, CGE3c	Application Communication	Prepare and analyse a budget for a given case study using a standard budget framework
5. The Cost of Living	225 min	PFV.01, PFV.02, PFV.03, PFV.04, PFV.05, PF3.04, CGE2b, CGE2c, CGE3c, CGE5e	All Achievement Chart Categories	Design a personal budget based on individual career paths and portfolio information; analyse the effect of life changes on the budget

Activity 7.1: The Wide World of Money

Time: 225 minutes

Description

Students investigate the need for currency exchange and the mathematics of currency conversions. Skills are extended with use of Internet to analyse the purchasing power of the Canadian dollar.

Strand(s) & Learning Expectations

Strand(s): Personal Finance Decisions

Ontario Catholic School Graduate Expectations

CGE5a - a collaborative contributor who works effectively as an interdependent team member.

Overall Expectations

PFV.04 - demonstrate the ability to make informed decisions involving life situations.

Specific Expectations

PF4.07 - compare the value of the Canadian dollar with the values of foreign currencies over a period of time and identify possible effects on purchasing and travel decisions.

Prior Knowledge & Skills

- Demonstrate facility in operations with rates, ratios, and proportions
- Judge the reasonableness of solutions
- Computer skills needed to obtain information from Internet sites
- Time required to review the basics of stock market purchases (i.e., What does buying a stock mean? How are stocks purchased? What are stock prices based on?).

Planning Notes

- Provide up-to-date currency conversion charts and stock market information from the business section of newspaper.
- The following time frame is suggested:
 - Introduce currency exchange and study the mathematics of currency conversions. Newspaper clipping of current currency exchange rates will need to be provided (75 minutes)
 - Activity 1 – Assess student knowledge using websites pertaining to foreign exchange rates and currency conversions. (75 minutes)
 - Activity 2 - Use knowledge of currency exchange to make decisions regarding which stock exchange to use to make stock purchases and to assess the best investment value (75 minutes)
- Reserve computer time (150 minutes) to provide access to Internet.
- Selectively place students in pairs.
- Test websites to be used in activities (see Resources).

Teaching/Learning Strategies

Teacher Facilitation

- Begin a class discussion on the importance of currency conversion. Include in the discussion the following topics:
 - Why exchange money to a foreign currency?
 - Where can we find currency exchange rates?
 - What are the names of currencies in different countries?
 - What is the meaning of exchange rates given in newspaper (e.g., \$1 U.S. = \$1.5293 Can)?
 - Why do currency exchange rates change every day?
 - What is the difference between buying and selling rates
- Teachers may choose to have students visit shopping websites from other countries and compare the cost of common items (e.g., CDs, groceries, etc.). This activity will establish a reason for carrying out currency conversions.
- Provide a lesson using the concept of ratios and proportions to solve currency conversion problems. Include in the lesson the conversion of Canadian dollars to foreign currencies as well as the amount of Canadian dollars received from selling a certain amount of foreign currency. Use a newspaper clipping for current exchange rates.

Follow-up Activity

The teacher should supplement the lesson with textbook exercises on:

- conversions among foreign currencies
- calculating the rate of exchange given corresponding currency amounts

Teacher Facilitation

- Activity 1 has students use a recommended Internet website to obtain current currency exchange rates.
- The teacher needs to explain the meaning of the different columns in the website.
- With the use of these rates, students convert a fixed amount of Canadian currency into the corresponding foreign currency for any five countries the students choose.
- Students then convert fixed amounts of foreign currencies supplied to them into Canadian dollars.
- A second website containing a currency converter verifies all pencil-and-paper calculations done.
- A third website provides students with visual representations of a variety of foreign currencies.
- Students also analyse and interpret the graphs given in the website relating fluctuations in the exchange rate over a period of time for the five countries selected in the activity.
- Computer facilities need to be provided.
- Alternate websites may be provided by the teacher.

Student Activity 1

Students use this activity to review currency conversions. An Internet website is provided to locate current currency exchange rates, to verify currency conversion calculations, and to view the appearance of foreign currencies and graphs of fluctuations in currency exchange rates over a period of time.

1. Choose five countries of interest and record them in the chart below. Using the website www.travlang.com/money/, enter the exchange rate between the countries you have chosen and Canada in the appropriate column.
2. Convert \$125 Canadian into the appropriate foreign currency. Show all of your calculations below the table. Record the amounts in the chart below.

Country	Exchange Rate	Amount of foreign currency for \$125 Canadian

3. Verify your currency conversions by using the Currency Converter located on the website www.travlang.com/money/.
4. Convert each of the fixed foreign currency amounts to Canadian dollars. Use the website www.travlang.com/money/ to record exchange rates. Show all of your calculations below the table.

Amount of foreign Currency	Exchange Rate	Amount in Canadian dollars
30 British pounds		
40,000 Spanish pesetas		
200 U.S. dollars		
50 French francs		
250,000 Italian lira		

5. Verify your currency conversions by using the Currency Converter located on the website www.travlang.com/money/.
6. Use the website www.travlang.com/money/ to:
 - a) observe the appearance of the foreign currencies of the countries you selected;
 - b) examine the graphs relating the fluctuations in the exchange rates during a specified period of time. Explain why there would be fluctuations in currency exchange rates. Choose one graph and provide a summary of factors that may have influenced currency exchange rate fluctuations.
7. How might knowledge of currency exchange rates and fluctuations in exchange rates influence your travel decisions? Of the five countries investigated in question 1, which do you think would be the best travel value monetarily? Explain your choice.

Teacher Facilitation

Lead a class discussion regarding the difference between buy and sell rates of U.S. currency. Consider the situation in which money is lost when Canadian funds are converted to U.S. funds; a purchase is made; and the remaining U.S. funds are then converted back to Canadian currency. Additionally, a discussion of the incentives in particular countries of spending U.S. or Canadian money as opposed to domestic currency (i.e., value of U.S./Canadian dollar as compared to local currency).

- In Activity 2, students extend their knowledge of currency exchange in a stock market application that involves comparing foreign and domestic stock markets to determine the best investment value. **Note:** it is not the intention of this activity to prepare students to make sound stock market investments, but merely to compare stock purchase prices on different stock exchanges.
- Sample companies that trade on both Canadian and foreign stock markets are provided (the teacher may supplement this list with other examples).
- Further stock information may be obtained either through newspaper sources or from the Internet. Similarly, current currency exchange information can be obtained on the Internet or may be provided by the teacher.
- A lesson on how to interpret stock share prices is required.
- A class discussion on the value of investing in ethical funds is recommended.
- Students may work in partners or small groups to complete this activity.
- Each group should prepare a written report to summarize their recommendations. The written report rubric (see Appendix B) should be reviewed prior to beginning the activity.
- As an extension, teachers may consider implementing a longer-term stock market study: “give” student groups \$5000.00 CAD and have them “invest” in Canadian, American and other foreign markets. They may then track their investments over the course of the semester, reporting their final profits (or losses) in Canadian dollars.

Student Activity 2

You have recently been hired as a financial advisor at a local bank. One of your clients is interested in investing several thousand dollars in the stock market. She has researched several companies that trade on both the Toronto Stock Exchange (TSE) and the New York Stock Exchange (NYSE). She has determined the four companies in which she wishes to invest. She wants you to determine how to get the best value for her Canadian money. Should she trade exclusively on the TSE; the NYSE; or a combination of both? Use the Internet, or stock exchange information provided, to complete this activity.

1. Complete the following chart to organize your information. Include all of your conversion calculations in your written report.

Company	Price per Share On TSE (CAD)	Price per Share on NYSE (USD)	NYSE Price Converted to CAD	Decision
Nortel Networks (NT)				
General Motors (GM)				
Daimler-Chrysler (DCX)				
Sears (S) – NYSE (SCC) – TSE				

2. Based on the information obtained, what recommendations would you make to your client? Justify your recommendations with mathematical reasoning.
3. Are there any other factors that should be considered before your client invests? (e.g., Are there differences in commission rates or other service charges between the two stock exchanges. Will exchange rate fluctuations affect her long-term investment?) Are these factors significant enough to affect your recommendations?
4. Would your recommendations have been valid in:
 - a) the early 1990s when the exchange rate between Canada and the US was \$1.00 CAD for \$0.86 U.S.D?
 - b) the early 1970s when the exchange rate was \$1.10 U.S. for \$1.00 CAD?
5. In your research, you have come across a company that trades on more than one exchange: Disney: trades on both the New York and French Stock Exchanges
 - a) Complete the following table for this company. Show all of your calculations in your written report.

Company	Price per share on New York Stock Exchange (USD)	New York Stock Exchange Price Converted to CAD	Price per share on French stock exchange (Fr)	French price converted to CAD
Disney/Euro Disney				

- b) What recommendation would you make if your client was interested in investing in this company?
6. Are there any other companies that you have found in your research that trade on more than one stock exchange? If so, provide a comparison table for your client (similar to the tables used).

Assessment & Evaluation of Student Achievement

- Knowledge/Understanding skills can be assessed in a quiz on currency conversions; by student conferencing to determine understanding of exchange rates and how to calculate them; and within Internet activities (accuracy of currency conversions).
- Thinking/Inquiry/Problem-solving, Communication and Application skills can be assessed within the written reports using criteria outlined in Appendix B.
- Initiative, teamwork, and work habits can be assessed in group work sessions. The students' ability to work independently can be assessed by monitoring the extent to which they independently retrieve and interpret stock market information.

Accommodations

Provide extra time to complete Internet activities, if necessary.

Resources

Business section of newspaper (currency/stock market information)

Internet website pertaining to currency conversions; the appearance of foreign currency and the exchange rate fluctuation graphs www.travlang.com/money/

New York Stock Exchange: <http://www.nyse.com/>

Toronto Stock Exchange: <http://www.tse.com/>

French Stock Exchange: http://www.tdd.lt/slnews/Stock_Exchanges/Stock.Exchanges.html

Appendices

Appendix B – Written Report Rubric

Activity 7.2: The Informed Consumer

Time: 150 minutes

Description

Students identify advantages and disadvantages of various techniques of selling and types of sales incentives. Students choose a common retail item and compare purchasing costs and buying incentives for several modes of selling. Students independently summarize their findings and mathematically justify their recommendations for the purchase in a written report.

Strand(s) & Learning Expectations

Strand(s): Personal Finance Decisions

Ontario Catholic School Graduate Expectations

CGE5a - a collaborative contributor who works effectively as an interdependent team member;

CGE4f - a self-directed responsible life-long learner who applies effective communication, decision-making, problem-solving and resource management skills.

Overall Expectations

PFV.04 - demonstrate the ability to make informed decisions involving life situations.

Specific Expectations

PF4.06 - identify the advantages and disadvantages to the purchaser of various types of selling (e.g., Retail store, catalogue, telemarketing, multi-level marketing, Internet) and techniques of selling (the use of loss leaders, the use of incentives, such as coupons).

Prior Knowledge & Skills

- Calculate sales tax
- Currency conversions/applications of exchange rates
- Construct and analyse data in charts, tables, and graphs

Planning Notes

- Students use the Internet to research on-line shopping. It may be necessary to reserve computer lab time for a minimum of 75 minutes.
- A variety of retail sales flyers and catalogues should also be provided to the students for comparison of common retail items (ensure these are appropriate for the items being researched).
- Since Internet shopping research will likely involve U.S. (or other foreign) pricing, students need to have completed the section on currency conversions prior to this activity.
- If spreadsheet software is to be used, a review lesson may be necessary.

Teaching Learning Strategies

Teacher Facilitation

- As a whole class, brainstorm to elicit student knowledge of the various types of sales incentives (e.g., coupons, scratch and save, points, delayed payment plans).
- Arrange students in small groups to analyse the pros and cons of a specific type of sales incentive.
- Circulate amongst the groups to offer guidance and suggestions.
- Following this group activity, the groups present their findings to the class. The teacher supplements any information missed by student groups.

Student Activity 1

The students work in small groups to analyse the pros and cons of a specific type of sales incentive discussed in class. The students focus on the financial aspects (long-term and short-term) of each incentive type.

Teacher Facilitation

- This topic leads into a whole-class brainstorming session on the various types of retail selling (e.g., retail store, catalogue, telemarketing, Internet) and the advantages and disadvantages of each.
- Following this discussion, arrange students into pairs or small groups to complete student Activity 2.
- Various retail flyers and catalogues should be provided for price comparisons.
- Computer time will also be required to research the Internet shopping option.
- Teachers may choose a retail item suitable for their class to be researched and may opt to alter the information to be researched accordingly.
- Students submit a letter to their parents summarizing their findings. Provide a rubric in advance (see Appendix B).
- The teacher may also choose to have students share their findings through oral presentations (see Appendix A for oral presentation rubric).
- An extension activity is provided and teachers may choose to assess this based on the written report rubric (Appendix B).

Student Activity 2

Your family wants to purchase a new refrigerator for the home. You have been asked to research the various types of retail selling to determine the best option for your family. You have decided to limit your research to retail stores (specialty and big box), catalogue shopping, and the Internet.

1. Use a spreadsheet to complete the following chart:

	Item Cost	Delivery/ Shipping Costs	Sales Tax	Exchange Rate (if applicable)	Duty Charge	Total Purchase Cost in CAD\$	Delivery Time	Warranty Offered	Method of Payment Available	Level of Convenience (low, med, high)	Sales Incentives Offered
Retail Stores:											
Catalogue/ Mail-order											
Internet											

2. Construct an appropriate graph to compare total purchase costs of each of the retail selling methods.
3. Describe the other factors that may influence your purchase decision.
4. In a letter to your parents/guardians explain your recommendation for the refrigerator purchase. Justify your purchase decision based on sound mathematical reasoning and analyse all factors you considered in making your decision. Include the spreadsheet and graph to support your recommendation.

Extension

Would your recommendation change for lower-ticket items (e.g., clothing, books)? Repeat your analysis for a lower-priced item of your choice and make a mathematically justified recommendation for this item.

Follow-up Discussion

Lead a class discussion regarding the influence of media on purchase decisions and the pros and cons to the consumer of advertising techniques used to promote products. Students should consider the possible conflict between consumerism and personal values (i.e., The use of underpaid labour in third world factories).

Assessment & Evaluation of Student Achievement:

- Knowledge/Understanding components can be assessed based on the organization of information within the spreadsheet and the use of appropriate formulas to generate spreadsheet values.
- Thinking/Inquiry/Problem-solving and Application skills can be assessed within the letter to the parents/guardians based on the reasoning used, the graphs provided, and the selection of mathematical tools used to justify purchase decision.
- Communication skills can be assessed in Activity 1 using the Oral presentation rubric (Appendix A) and within the letter and/or oral presentation in Activity 2 using the appropriate rubric (Appendices A, B).
- Teamwork and initiative can be assessed in the group work components. Organization can be assessed within the written report. (See Appendix C for rubric)

Resources

Retail flyers and catalogues
Internet shopping site addresses

Appendices

Appendix A – Oral Presentation Rubric
Appendix B – Written Report Rubric
Appendix C – Learning Skills Rubric

Activity 7.3: A Credit Concern

Time: 225 minutes

Description

Students study and compare the features of various credit and debit cards. The effects of delayed and minimum payments on credit card balances are investigated with the use of spreadsheets.

Strand(s) & Learning Expectations

Strand(s): Personal Finance Decisions

Ontario Catholic School Graduate Expectations

CGE7b - a responsible citizen who accepts accountability for one's own actions.

Overall Expectations

CIV.03 - demonstrate an understanding of the effect on investment and borrowing of compounding interest.

Specific Expectations

CI3.11 - determine, through investigation, the features of various credit and debit cards;

CI3.12 - demonstrate, using technology, the effects of delayed payment on a credit card balance, on the basis of current credit card rates and regulations.

Prior Knowledge & Skills

- Facility in operations with percent
- Judge the reasonableness of solutions
- Facility with computer spreadsheet software

Planning Notes

- Provide debit card information from various local banks (if Internet access will not be available).
- Provide various anonymous credit card
- Reserve computer time (75-150 minutes).
- If spreadsheet programs have not been used previously, a lesson on spreadsheet software may be required.

Teaching/Learning Strategies

Teacher Facilitation

- Lead a class discussion on the advantages and disadvantages of using debit cards (e.g., availability of debit machines; bank charges for use; decreased need to carry cash; time-savings when doing banking; effects on bank teller jobs; etc.). The discussion should be supplemented with information regarding the fees that local banks impose for using debit cards (e.g., number of bank card transactions that are allowed; charges for using other bank machines, etc.).
- To complete Activity 1, the teacher should provide students with debit card information from a variety of local banks.
- Working in partners, have students complete a summary information table for debit cards from various local institutions.
- Solutions can be collected and assessed for knowledge/understanding and communication.

Student Activity 1: Analysing Debit Cards

1. Use the information provided to complete the following information table. For consistency, use information that pertains to student or youth savings accounts.

Bank Card	Service Charges to Use	Fees for Using Other Bank Machines	Incentives Offered

2. Suppose you have the following transaction record for one month:
 - your student savings account has a balance of \$512.29
 - you make five bank machine withdrawals of \$10.00 each from your own bank's ATM.
 - you make three bank machine withdrawals of \$20.00 each from another bank's ATM.
 - you make two deposits: one of \$85.00 and one of \$105.24 using your bank's ATM.
 - you make 10 direct payment purchases that total \$215.64 at various local storesUse the debit card information from question 1 to calculate the charges that will be applied to your account this month, and the closing balance of your savings account at the end of the month? Which banking institution offers the best rates for your banking habits this month. Show all of your calculations for each debit card researched.
3. Compare the advantages and disadvantages of carrying cash versus using debit cards.

Teacher Facilitation

- This discussion of debit card use leads into a discussion of an alternative form of payment that is provided by credit cards.
- As a whole class, brainstorm a list of the various credit cards available
- Lead a class discussion to elicit the advantages and disadvantages of credit cards.
- Using prepared overhead transparencies of sample credit card statements, lead students through an analysis of information found on credit statements.
- Organize students in pairs and distribute sample credit card statements to each group (alternately, students may work in partners to find the necessary information on the Internet).
- Students are to complete a table analysing the features of various credit card types, using the sample credit card statements or Internet information.
- Following this activity, the results should be discussed on a whole-class basis. Discussion points to consider include: benefits to the credit card company in providing credit; the importance of verifying transaction information, and factors to consider when choosing a credit card. Additionally, it may be appropriate to discuss the consequences to the consumer of the excessive use of credit cards to make purchases that are beyond what they can afford.

Student Activity 2: Comparing Credit Cards

1. Use the Internet, or credit card statements provided, to complete the following table:

Credit Card	Where Can it be Used?	User Fee	Incentives to use	Annual Interest Rate	Daily Interest Rate	Minimum Payment Calculation	How can bills be paid?	Is Cash Advance Offered?	Options if Lost?
Visa									
MasterCard									
American Express									

2. Which credit card do you think offers the best features for the consumer? Do you think consumers should have more than one credit card? Explain your answer.

Teacher Facilitation

- Upon completion of Activity 2, emphasize the following in a class discussion:
 - the advantages/disadvantages of credit and debit cards.
 - the features of different credit cards.
 - the benefits of credit card use to credit card companies.
 - the verifying of correct transaction information.
 - the consequences for non-payment of credit cards.
- Before proceeding to Activity 3, provide opportunities for students to practise calculating interest charges on credit card balances. **Note:** that for past-due bills, interest may be charged retroactively on all purchases from the date they were posted to the credit card (using the daily interest rate).
- Teaching time must be spent developing the formulas that will be used in the spreadsheets.
- The written report rubric (Appendix B) should be reviewed prior to beginning the activity.
- All or part of the activity may be assessed using an oral presentation. (see Appendix A for rubric)

Student Activity 3: Credit Card Debt

You have a credit card balance of \$513.24 for a stereo you purchased on February 3rd. The payment is due at the first of every month. The credit card company charges an annual interest rate of 17.5%, and calculates minimum payment amounts as \$10.00 or 3% of the balance, whichever is higher. The interest charges are calculated retroactively to the purchase date using the daily interest rate. You are unable to pay the balance off in full at this time and are considering three different payment options:

- i) paying the minimum payment amount until the balance is paid in full
 - ii) paying the minimum payment amount for 6 months and then paying the balance in full
 - iii) paying \$75.00 each month until the balance is paid in full
1. Create three different spreadsheets, using the format shown below to illustrate the scenarios described above. Develop formulas for the appropriate cells of the spreadsheet to complete the required calculations. Show sample calculations for each spreadsheet in your written report.

Month of Payment	Amount Due (\$)	Due Date	Payment Made (\$)	Balance After Payment	Interest Rate per Day (%)	Total Interest Charged (\$)	New Balance (\$)
1	500	Mar. 1					
2							
3							
4							
5							

This activity assumes no other purchases are made on this credit card

Note that the “New Balance” becomes the “Amount Due” in the next line

General Questions

1. If the stereo had cost \$1000.00, what effect would this price change have on the amount of interest paid and the time required to pay off the bill, under each of these payment plans?
2. Suppose your local bank is offering fixed-rate personal loans (minimum \$1000.00) at a rate of 10% per year. Would it be to your advantage to take out a loan to pay off your credit card debt? Show calculations to support your answer.

Teaching Option: For students requiring additional direction use the following guided questions.

Scenario 1

1. What is the balance due after 4 months? 6 months?
2. How much time is required to pay off this bill, using this payment method?
3. What is the total cost of using a credit card to purchase the stereo if you follow this payment method?

Scenario 2

1. What is the total cost of using a credit card to purchase the stereo if you follow this payment plan?

Scenario 3

1. What is the total cost of using a credit card to purchase the stereo if you follow this payment plan?
2. Will this payment plan cost you more or less than Scenario 2? What is the cost difference between Scenarios 2 and 3?

Follow-up Skills

Teacher should supplement these activities with a variety of paper-and-pencil type questions involving the effects of delayed payment and minimum payments on credit card balances.

Assessment & Evaluation of Student Achievement

- Knowledge/Understanding can be assessed in pencil-and-paper tasks and quizzes on interest calculations and delayed payment effects.
- If directed questions in the teaching option box are not utilized, students may be assessed for Thinking/Inquiry based on their analysis of the delayed payment scenarios.
- Communication can be assessed within the written and oral reports using the criteria outlined in Appendices A and B.
- Application can be assessed based on the formulas used to produce the spreadsheets and on the ability to create workable spreadsheets.
- Initiative and teamwork, can be assessed in the group work components.
- Organization can be assessed within the written and oral reports (see Appendix C for rubrics).

Accommodations

- Provide students having difficulty with a prepared spreadsheet.
- Allow extra time to complete written reports when warranted by the individual student's IEP.

Resources

Choices and Decisions – Taking Charge of Your Financial Life (a resource available from VISA – see www.visa.com)

Appendices

Appendix A – Oral Report Rubric

Appendix B – Written Report Rubric

Appendix C – Learning Skills Rubric

Activity 7.4: Building a Budget

Time: 195 minutes

Description

This activity introduces students to the use of budgets as an organizational and analytical tool for household finances. Students work in small groups to complete a budget analysis for an assigned case study. Students use provided financial information and estimated living costs for the assigned scenario and, using appropriate mathematical forms such as charts, graphs, spreadsheets and calculations, explain and justify the budgets generated.

Strand(s) & Learning Expectations

Strand(s): Personal Finance Decisions

Ontario Catholic School Graduate Expectations

CGE2b - an effective communicator who reads, understands and uses written material effectively;

CGE2c - an effective communicator who presents information and ideas clearly and honestly and with sensitivity to others;

CGE3c - a reflective and creative thinker who thinks reflectively and creatively to evaluate situations and solve problems.

Overall Expectations

PFV.03 - design effective personal and household budgets for individuals and families described in case studies.

Specific Expectations

PF3.01 - describe and estimate the living costs involved for different family groupings (e.g., A family of four, including two young children; a single young person; a single parent with one child);

PF3.02 - design a budget suitable for a family described in a given case study, reflecting the current costs of common items (e.g., interest rates, utility rates, rents), using technology (e.g., Spreadsheets, budgeting software, the Internet);

PF3.03 - explain and justify budgets, using appropriate mathematical forms (e.g., Written explanations, charts, tables, graphs, calculations).

Prior Knowledge & Skills

- Construct and analyse graphical representations of data
- Make reasonable estimates
- Calculate percentages
- Construct and analyse charts, tables and spreadsheets

Planning Notes

- Prepare an appropriate number of case studies for student groups (see Appendix for examples) with scenarios that are realistic for your class.
- Prepare “actual” values to correspond to each case study. These values should be realistic for your region.
- Provide students with a budget framework to guide work on activity (see Appendix for sample)
- Reserve computer facilities to allow students to use appropriate software to construct spreadsheets, graphs, charts, etc.
- If spreadsheets have not been used in previous activities, a lesson on the use of spreadsheet/budgeting software may be necessary.

Teaching/Learning Strategies

Teacher Facilitation

- Have students brainstorm in groups to list the major categories for income and expenses that will form the budget framework. (**Note:** the sample budget framework provided in the appendix is only a guide and should be altered to suit the needs of the class). Students could design the budget framework themselves and the design could be used to assess problem-solving.
- Arrange students into small groups and distribute a case study to each group.
- Students should organize the financial information for their case on a spreadsheet (computer facilities will need to be available).
- Have students explain how they may have had to modify their original budget to incorporate the information provided in the case studies.
- Teachers circulate among the groups to help students make realistic estimations of some expenses. Sample household utility bills may also be available to help students to estimate living costs.
- In the interest of time, it is recommended that students submit one written report per group. Similarly, if oral presentations are to be utilized, one presentation per group is sufficient.

Student Activity 1

Students use the information in their case study to fill in the budget framework provided. This information is best organized using a spreadsheet or budgeting software. Based on an analysis of the budget, each group completes a written report and shares their analysis with the class in the form of an oral presentation.

Instructions for students:

1. Read over the case study assigned to your group. The case studies incorporate a considerable amount of information. The assessment of your work will focus on the best use of the information provided since there is more than one way to use it.
2. As a group, determine realistic values to complete the budget framework provided. The budget information should be organized using a spreadsheet or budgeting software. Be prepared to explain and justify how you arrived at your values.
3. Use the spreadsheet to determine the total income as compared to the total expenses.
4. If there is a budget deficit (i.e., expenses are greater than income), decide amongst your group how the budget could be adjusted. Consider how discretionary items (e.g., cable TV, entertainment) could be altered to produce a more acceptable budget.
5. Based on the information you have budgeted for, calculate the percentage of total income spent on:
 - Housing (rent/mortgage/taxes/insurances)
 - Food
 - Savings
 - Utilities (phone, cable, hydro, heat, etc.)
 - Vehicle costs (payments/gas/insurance)
 - Child Care
 - Entertainment
 - Charitable Donations
 - Other
6. Complete a written report to summarize the budget for your case study. Include in your report clear justifications for the values chosen by your group. Your report should also include suitable graphs to compare relevant information from your budget. Evaluate the financial situation for the family described in your case. Make recommendations that could improve the family's financial future. Refer to the written report rubric when preparing your report.
7. Organize your information into an effective oral presentation. Assign each group member to an equal portion of the oral presentation. Refer to the oral presentation rubric when preparing your report.

Teacher Facilitation

- Students should present their findings to the class in the form of a formal oral report. Rubrics for the oral presentation and written report should be reviewed with the students in advance.
- Class discussion of each case enhances the learning experience.
- Following the presentations, distribute the actual income/expense solutions to each group. Teachers should model these "actual" values to reflect realistic local living expenses.
- Groups are to re-convene and compare their budgeted information with the actual values. They are to assess the validity of their budgets and determine the areas that had unrealistic estimates.
- A written report is to be submitted and should be evaluated using a rubric (see Appendix B). This activity provides some further insight prior to completing Activity 7.5.

Student Activity 2

Your teacher will distribute the actual income/expenses for your case. Within your group, compare your budgeted values with these actual values.

1. Add a column to your spreadsheet entitled "actual values" and fill in the information supplied by your teacher.
2. Add another column entitled "difference from budgeted values" and calculate the differences.
3. In which areas were your budgeted values within 10% of the actual values? Show your calculations to justify your answer. Indicate these areas on your spreadsheet by using shading or borders.

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4. In which areas were your budgeted values more than 10% off the actual values? Show your calculations to justify your answer. Show these areas on your spreadsheet with different shading or borders than in spreadsheet 2.
 5. Write a summary report to explain any differences between your budget and the actual values. What changes would you make in your estimations next time?
 6. Re-assess the financial situation of the family in your case study based on the actual values provided. Make any recommendations for financial improvements based on these actual values.

Assessment & Evaluation of Student Achievement

- A short paper-and-pencil test (approximately 45 minutes) can be utilized to assess desired categories of the Achievement Chart. The test should allow students to design and analyse a budget for a given case scenario. Basic calculations, estimations, fund allocation, partitioning and recommendations for financial planning can be incorporated in the design of the test.
- Problem-solving can be assessed based on the organization and design used by students in the development of the budget framework (if this was not provided by the teacher)
- Thinking/Inquiry/Problem-solving and Application can be assessed based on the graphs, and justification used in the written and oral reports (see Appendices A and B).
- Communication skills can be assessed within the written report and oral presentation using the criteria outlined in Appendices A and B.
- Teamwork, initiative, and organization can be assessed within the group work sessions, using the learning skills rubric (Appendix C).

Accommodations

- Group students with reading/writing difficulties with others who can provide help
- Allow extra time when warranted by the individual student's IEP
- Allow students with difficulties in oral communication to practice their presentations with teacher feedback

Appendices

Appendix A – Oral Report Rubric

Appendix B – Written Report Rubric

Appendix C – Learning Skills Rubric

Budget Framework

Case Studies

Appendix

Sample Case Studies

Case 1: Married/Double Income

Julio and Theresa have been married for two years and have recently purchased their first home, a 1500 square foot bungalow, for \$150 000.00. They had a down payment of \$20 000.00 and mortgaged the rest. They have a 10-year term mortgage (amortized over 30 years) at 8.5% per annum. They make mortgage payments twice a month. The home is heated with natural gas and they have subscribed to cable television. The taxes on the home are calculated at a rate of 2% of the value of the home. The taxes are divided into four equal payments per year. They have homeowners insurance that covers the contents and replacement cost of the home. Julio is a computer technician making \$38 500/year. His salary is paid weekly and his net pay is 70% of his gross salary. He also pays benefits that amount to \$150 per month. Theresa is an assembly plant worker who makes \$22/hour and generally works a 40-hour regular work-week plus six hours overtime, for which she is paid at a rate of time and a half. She is paid weekly and her total deductions are 40% of her gross pay. Julio has student loan payments of \$250/month and has 12 payments left. They also have a credit card debt of \$3000.00, which they are paying off at a rate of \$200/month. They are paying a credit card interest rate of 18% per annum. They have agreed that until the credit card is paid off, they will not use it. They have one car that is paid for and a second small car that they have just leased for \$300/month. The combined insurance cost for the cars is \$1500.00 per year, which they pay monthly. There is a one-time service charge of \$35.00 for choosing this payment option. They have not started any retirement investments yet and have \$2000.00 in their savings account. Once a week, Julio and Theresa go out to dinner and a movie. Once a year, they vacation for one week in Florida. They have no children, but would like to start a family in the next year or so.

Case 2: Married/Double Income with Children

Lisa and Mohammed have been married for 10 years. Lisa is a respiratory therapist making \$50 000.00 per year. Lisa is paid biweekly and her net pay is 65% of her gross salary. She does not receive benefits. Mohammed is a police officer making \$55 000.00 per year. He is also paid biweekly and his total deductions are 40% of his gross pay (included in these deductions are his benefits). They have just moved to a new city and have decided to rent, rather than buy a house. They rent a 3-bedroom home and pay \$1200 per month. They are responsible for paying all utilities and insurance on the contents of the house. They do not pay the property taxes on the house. The house has electric heat, cable television and two phone lines to accommodate their Internet connection. They have three children, ages seven, four, and one. The two younger children are in daycare, which costs \$30.00 per day per child. They drive a two year-old mini-van with payments of \$300.00 per month. The insurance costs \$800.00 per year, which they pay monthly. They have a family membership at the local gym and enjoy swimming and working out. They pay monthly for their membership. They do not carry a credit card balance, preferring to pay off their bills when they are due. This month's credit card bill is \$1500.00. They are also trying to save for their children's education and contribute \$200.00 per month, in total, to an RESP. With three children, their social life is limited to a play, once a month, at the community theatre, which costs \$25.00 per ticket, and the occasional dinner out. On Friday's, they order pizza and videos to enjoy with their children. They are saving money to purchase a house and currently have \$5000.00 in their savings account. They would like to buy a house by the end of the year. The family attends Mass regularly at St. Mary's church and contributes \$10 to the weekly collection.

Appendix (Continued)

Case 3: Single

Keisha is a secretary at a local construction company. She makes \$12.00 per hour and usually works 37 hours per week. She does not work overtime. She is paid weekly and her deductions amount to 25% of her gross pay. She just bought her parents' old car for \$2000.00. She pays them \$150.00 per month and pays \$500.00 per year for insurance. Her insurance payments are made monthly. Keisha still lives at home, and pays \$300 per month rent to her parents. She also contributes \$50.00 per week for groceries. Keisha goes out for lunch three times a week with her co-workers and eats out with friends every Saturday evening. She has decided to return to college part-time, in the evening, to earn a diploma in Social Work. Her tuition costs \$500 per semester and her books cost \$250 per semester. She has recently purchased a computer and printer for \$2300.00 and makes monthly payments to the computer store. The computer store had a sales incentive offering equal monthly payments with no interest or service charges. Keisha carries a credit-card balance of \$1500.00 and makes payments of \$100.00 per month. She is being charged an annual interest rate of 18%. Keisha makes contributions of \$25.00 per week to an RRSP and donates 2% of her net monthly earnings to sponsor a child in a third-world country. She is saving for a dream vacation to Europe.

Sample Budget Framework

	Budgeted Amount Per Month (\$)	Actual Amount Per Month (\$)
Savings/Investments:		
Income:		
Main Job		
Other Sources		
Total Income		
Expenses:		
Rent/mortgage		
Property taxes		
Electricity		
Heat		
Home Insurance		
Telephone		
Cable Television		
Groceries		
Car payments		
Gas		
Car Insurance		
Car repairs/maintenance		
Life Insurance		
Day Care		
Tuition Fees		
Student Loans		
Other educational costs		
Membership fees		

Dining out		
Other Entertainment Costs		
Credit Card Payments		
Charitable Donations		
Total Expenses		
Balance (Income – Expenses)		

Activity 7.5: Summative Assessment: The Cost of Living

Time: 225 minutes

Description

Students extend their knowledge of budgets introduced in Activity 7.4 by designing a personal budget based on their chosen career path. Using a template, spreadsheets, charts, and tables, they design a budget that reflects the information in their portfolio, as well as details provided in a “Life Scenario”. Using spreadsheets, students study the impact of changes to a budget using “Unexpected Changes” scenarios. They share their experiences during oral presentations, while general knowledge and impressions are to be summarized using a journal entry.

Strand(s) & Learning Expectations

Strand(s): Designing Budgets

Ontario Catholic School Graduate Expectations

CGE2b - an effective communicator who reads, understands and uses written materials effectively;

CGE2c - an effective communicator who presents information and ideas clearly and honestly and with sensitivity to others;

CGE3c - a reflective and creative thinker who thinks reflectively and creatively to evaluate situations and solve problems;

CGE5e - collaborative contributor who respects the rights, responsibilities and contributions of others.

Overall Expectations

PFV.01 - demonstrate an understanding of the costs involved in owning and operating a vehicle;

PFV.02 - determine, through investigation, the relative costs of renting an apartment and buying a house;

PFV.03 - design effective personal and household budgets for individuals and families described in case studies;

PFV.04 - demonstrate the ability to make informed decisions involving life situations;

PFV.05 - apply decision-making in the investigation of career opportunities.

Specific Expectations

PF3.04 - determine the effect on an overall budget of changing one component, using a spreadsheet or budgeting software;

In addition - the outcomes of all specific personal financial decision expectations are utilized in this summative activity.

Prior Knowledge & Skills

- Development and use of spreadsheets
- Knowledge of the basic elements of a personal budget
- Knowledge of accommodation and vehicle cost calculations

Planning Notes

- Students will work individually using their portfolio information.
- Assign “Life Scenarios” to each student (see Appendices).
- Match “Unexpected Changes” to the appropriate “Life Scenario” (i.e., if a homeowner, do not give a change related to an apartment).
- Provide access to computers (spreadsheets or budgeting software).

Teaching/Learning Strategies

Teacher Facilitation

- Activity 1 reinforces and extends students' knowledge of the elements of a personal budget.
- Students develop a budget template for use in the remaining activities. It should reflect all the necessary basic elements (housing, food, utilities, savings, transportation, etc.) and any other elements that are applicable to the students. The template used in Activity 7.4 may be used and altered as required.

Student Activity 1

The students develop a template for a basic personal budget based on the examples provided in previous case studies. This template will be modified in Activity 2 to meet the criteria of the assigned scenarios.

Teacher Facilitation

- Activity 2 makes the concept of budgets more personal and students are to use their own “career” information to develop individual budgets.
- In order to make this activity more realistic, “Life Scenarios” are used to direct the students in formulating their budgets. Sample “Life Scenarios” are provided in the Appendix but should be expanded and modified to suit the needs of the individual class. Teachers may choose to put these “Life Scenarios” on index cards and have students randomly draw their scenario.
- Budgets should be designed using spreadsheet or budgeting software as they will be used and modified in part 3 of Activity 7.5.
- Travel brochures should be made available to students (alternately, they may choose to research travel destinations on the Internet).

Student Activity 2:

Using spreadsheets the students are to develop a personal budget, based on the template from Activity 1 that includes their portfolio information and the assigned scenario.

1. You will receive a “Life Scenario” indicating the parameters (marital status, earnings of spouse, college loans, number of children) for developing your personal budget.
2. You are to calculate/estimate your total monthly income, based on the information provided.
3. Information from Unit 5 (accommodation) and Unit 6 (vehicle costs) is to be re-examined and placed in the budget.
4. You should determine a realistic amount for your savings/investments.
5. Other costs are to be calculated/estimated based on realistic information (estimates of local utilities, information from parents, Internet).
6. The overall budget should be calculated using a spreadsheet, and adjusted, as needed, to avoid a deficit situation.
7. It has been decided that a portion of the money remaining at the end of the month will be used towards a vacation. This vacation will be as simple or as extravagant as your budget will allow. Choose three destinations (two must be in another country) that can be accommodated by your budget. Prepare a cost analysis of this vacation (including transportation, accommodation, entertainment, etc.) in Canadian funds. How long will it take you to save for this vacation? What percentage of your discretionary income will be spent in each case? Which destination will you choose? Why?
8. A copy of the budget and travel cost analysis is to be included in the your portfolio.

Teacher Facilitation

- Activity 3 demonstrates how certain factors can affect budgeting by providing students with “Unexpected Changes” (scenario cards) that must be factored into their budgets. Samples of “Unexpected Changes” are provided in the Appendix but should be expanded and modified to suit the needs of the class. The actual monetary value of some of these changes can be estimated based on local factors. Teachers may choose to put these “Unexpected Changes” on index cards to be randomly drawn by students.
- The impact of these changes can best be illustrated by having individual students present their case history. By sharing their experiences, students can learn about a variety of real-life situations that can affect one’s budget. The journal questions can be adapted to particular class concerns.
- Students will each receive one “Unexpected Change” scenario, which will provide information about a real-life situation that affects one’s budget. Students must modify their personal budget to reflect this change and then share their experience and knowledge with the class.

Student Activity 3

1. You will receive an “Unexpected Change” scenario.
2. Using the budget developed in Activity 2, modify your personal budget to reflect the change. This may mean repartitioning the funds, moving money from savings, etc.
3. Will this “Unexpected Change” affect your ability to afford the vacation planned for in Activity 2? Explain.
4. You are to include a copy of your modified budget in your portfolio.
5. You are to present your scenarios and budgets. Oral presentations, focus on the variety and impact of these changes on personal budgets in general.
6. You should record your own views regarding personal budgets and the various challenges in a journal by addressing various concerns. For example,
 - a) What impact does an “unexpected” change have on one’s budget?
 - b) How might one prepare for the unexpected challenges to one’s budget?
 - c) Given the outcome of your personal budget, comment on your impressions of your choice of career and the lifestyle it can provide. Will you now consider other career opportunities or are you satisfied with your career choice?

Assessment & Evaluation of Student Achievement

- Knowledge/Understanding can be assessed within the budgets produced (i.e., partitioning of funds and the adjustments made based on the “unexpected changes”). Individual conferencing can also be used to assess the understanding of realistic budget values. Students may demonstrate their knowledge of resource partitioning by completing a budget in a quiz format.
- Communication can be assessed in oral presentations and journals using rubrics.
- The design of the budget to allow appropriate partitioning of funds can be used to assess Problem-solving skills.
- Application can be assessed by the ability of students to incorporate the given changes into the personal budget in Activity 3 (i.e., Which budget factors need to adjusted; accuracy of adjustments).
- Organization, initiative, work habits, and independence could be assessed during all the activities using the learning skills rubric (Appendix C).
- Opportunities for teamwork can be assessed throughout, by monitoring the sharing of individual approaches and ideas. Peer evaluations may also be utilized to assess teamwork.

Accommodations

- Group students with reading or writing difficulties with other students who will be able to help them.
- Alter case studies as necessary to accommodate students.
- Allow extra time when warranted by the individual student's IEPs.
- Allow students with difficulties in oral communication to practice their presentations with teacher feedback.

Appendices

Appendix A – Oral Report Rubric

Appendix B – Written Report Rubric

Appendix C – Learning Skills Rubric

“Life Scenarios”

“Unexpected Changes”

Appendix

Sample Life Scenarios

Marital Status	Net Earnings of Spouse	Accommodation	College Loan	Number of Children
Single		Apartment	None	None
Single		small house	None	None
Married	none	small house	None	2
Married	\$15 000/year	Apartment	\$10 000 to be paid off in 10 years	2
Married	\$20 000/year	House	\$10 000 to be paid off in 10 years	1
Married	none	House	None	3
Married	\$30 000/year	House	None	3

Appendix

Sample “Unexpected” Changes Scenarios

Category	Change
Apartment	rent increase of 2% per year
House	need new roof
House	need new furnace
Car	need new transmission
Car	need new exhaust system
Job	6-month lay-off with 15% of pay
Job	promotion with an increase of 10% in pay
Spouse	promotion with an increase of 10% in pay
Spouse	parental leave – receive 55% of pay for 1 year

Appendix A

Oral Presentation Rubric

(Adapted from the Grade 10 Mathematics Applied: Catholic Course Profile)

Category	Level 1 (50 – 59%)	Level 2 (60 – 69%)	Level 3 (70 – 79%)	Level 4 (80 – 100%)
Knowledge/ Understanding - understanding of concepts - ability to perform algorithms	- demonstrates a limited understanding of concepts - limited ability to perform algorithms	- demonstrates some understanding of concepts - performs algorithms with some ability	- demonstrates a considerable understanding of concepts - regularly performs algorithms with considerable accuracy	- demonstrates a thorough understanding of concepts - consistently and accurately performs algorithms with a high degree of accuracy
Thinking/ Inquiry/ Problem-solving - logical and organized presentation of argument	- presents arguments with limited logic and organization	- presents arguments with some logic and organization	- presents arguments with considerable logic and organization	- presents arguments with consistent logic and organization
Communication - use of mathematical terms - response to questions	- limited use of appropriate mathematical terminology - can respond effectively to a limited number of class questions	- inconsistent use of appropriate mathematical terminology - can respond effectively to some class questions	- regular use of appropriate mathematical terminology - can respond effectively to a considerable number of class questions	- consistent use of appropriate mathematical terminology - can respond effectively to class questions
Application - generalization	- limited generalization of mathematical relationships	- generalizes some mathematical relationships with prompting	- effectively generalizes mathematical relationships	- generalizes mathematical relationships beyond scope of task

Note: A student whose achievement is below level 1 (50%) has not met the expectations for this assignment or activity.

Appendix B

Written Report Rubric

(Adapted from the Grade 10 Mathematics Applied: Catholic Course Profile)

Category	Level 1 (50 – 59%)	Level 2 (60 – 69%)	Level 3 (70 – 79%)	Level 4 (80 – 100%)
Knowledge/ Understanding - understanding of concepts - ability to perform algorithms - presentation of data in tables and graphs	- demonstrates limited understanding of concepts - requires considerable help to perform simple mathematical algorithms - tables and graphs present data limited accuracy	- demonstrates some understanding of concepts - performs some simple mathematical algorithms with accuracy - tables and graphs present data some accuracy	- demonstrates considerable understanding of concepts - performs mathematical algorithms of some complexity with accuracy - tables and graphs present data considerable accuracy	- demonstrates a thorough understanding of concepts - performs complex mathematical algorithms with accuracy - tables and graphs present data a high degree of accuracy
Thinking/Inquiry/ Problem-solving - presentation of arguments using logic and organization	- presents arguments with limited logic and organization	- presents arguments with some logic and organization	- presents arguments with considerable logic and organization	- presents arguments with logic and organization
Communication - use of appropriate mathematical terms - drawing conclusions	- limited use of appropriate mathematical terminology - makes limited appropriate conclusions	- some use of appropriate mathematical terminology - makes some appropriate conclusions	- considerable use of appropriate mathematical terminology - makes considerable appropriate conclusions	- consistent use of appropriate mathematical terminology - makes effective conclusions
Application - application of concepts or procedures	- applies concepts or procedures to problems seen in familiar settings in limited ways	- sometimes applies concepts to problems seen in familiar settings	- regularly applies concepts and procedures to problems seen in familiar settings	- consistently applies concepts and procedures to problems seen in familiar, and some unfamiliar settings

Note: A student whose achievement is below level 1 (50%) has not met the expectations for this assignment or activity.

Appendix C

Learning Skills Checklist

(Adapted from Grade 10 Mathematics Applied: Catholic Course Profile)

Works Independently: The student requires no supervision and is self-reliant

Needs Improvement	Satisfactory	Good	Excellent
- requires constant supervision to complete work	- requires moderate supervision to complete work	- requires minimal supervision to complete work	- completes work without supervision
- selects materials, resources and activities with considerable direction and assistance	- selects materials, resources and activities with some assistance	- selects materials, resources and activities with minimal assistance	- selects materials, resources and activities independently
- requires consistent encouragement and reinforcement to remain on task	- requires some encouragement to remain on task	- requires minimal encouragement to remain on task	- remains on task independently
- uses a variety of learning strategies with direction and assistance	- uses a variety of learning strategies when provided with some assistance	- uses a variety of learning strategies	- uses a variety of learning strategies independently and effectively

Work Habits/Homework: The student complete homework; demonstrates on-task behaviour and demonstrates appropriate classroom behaviour

Needs Improvement	Satisfactory	Good	Excellent
- often does not complete homework	- requires frequent reminders to complete homework	- regularly completes homework	- consistently and independently completes homework
- requires considerable supervision to follow instructions	- requires some supervision to follow instructions	- requires minimal supervision to follow instructions	- follows instructions without supervision
- has difficulty taking complete and/or accurate notes	- occasionally takes complete and/or accurate notes	- regularly takes complete and accurate notes	- takes accurate, detailed notes, often adding own information
- requires regular conferencing to complete work and demonstrate appropriate behaviour	- requires some reminders to complete work and demonstrate appropriate behaviour	- accepts responsibility for work completion and appropriate classroom behaviour	- accepts responsibility and consequences for work completion and classroom behaviour

Appendix C (Continued)

Teamwork: The student contributes to the overall group effort by sharing information, developing ideas and show respect to team members

Needs Improvement	Satisfactory	Good	Excellent
- has difficulty working toward group goals	- occasionally works toward group goals	- usually works toward group goals	- consistently identifies group goals and works toward achieving them
- has difficulty following direction and shares little information	- occasionally follows direction and shares information with the group	- usually follows direction well and readily shares information with the group	- consistently follows direction well and readily shares useful information with the group
- rarely performs more than one role in the group	- occasionally performs more than one role in the group	- usually performs more than one role in the group	- consistently performs more than one role in the group
- rarely contributes to the development of group ideas	- occasionally contributes to the development of group ideas	- usually contributes to the development of group ideas	- consistently contributes to the development of group ideas

Organization: The student is able to give structure or order to a task

Needs Improvement	Satisfactory	Good	Excellent
- requires considerable supervision to follow established routines	- requires some reminders to follow established routines	- follows established routines and has developed effective personal routines	- follows established and personal routines independently and successfully
- has difficulty meeting deadlines	- requires consistent reminders to meet deadlines	- regularly meets deadlines	- consistently meets deadlines
- rarely brings resources required for class	- occasionally brings resources required for class	- usually brings required resources to class	- consistently brings required resources to class
- has difficulty with time management	- requires help with time management strategies	- is able to develop and use time management strategies	- consistently able to develop and utilize time management strategies

Appendix C (Continued)

Initiative: The student is a self-starter who immediately begins tasks, demonstrates leadership, promotes group dynamics, develops new ideas, offers assistance to others, is creative and enthusiastic, is confident, and accepts responsibility for own learning.

Needs Improvement	Satisfactory	Good	Excellent
- requires supervision to start and complete tasks	- occasionally requires supervision to start and complete tasks	- able to independently begin and complete tasks	- consistently and independently begins and complete tasks
- requires help to develop a plan of action and needs supervision to follow through with plan	- requires some supervision to develop and follow through with plan of action	- can develop and follow through with a plan of action	- consistently able to develop a plan of action and independently follows through with plan
- rarely takes on a leadership role within a group	- makes attempts to demonstrate leadership within a group	- regularly demonstrates leadership within a group	- consistently demonstrates leadership role within a group
- rarely volunteers creative ideas	- sometimes volunteers creative ideas	- regularly volunteers creative ideas	- consistently contributes creative ideas and promotes the sharing of ideas by other group members