

# **Year-at-a-Glance and Unit Outlines MEL4E: Mathematics for Work and Everyday Life**

**DRAFT**

**Including Rationale for Clusters of Expectations  
and Sequences of Units**

**NOTE: Expectation numbers will change from what they are  
in this draft which is based on an earlier draft of the  
curriculum expectations**



# Mathematics for Work and Everyday Life: Content and Reporting Targets

Mathematical Processes across all strands and terms:  
*Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting, Representing, and Communicating.*

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
<b>Interpreting and Displaying Data</b>  -begin with case studies and build on this technique through the course -collect student data such as income, filing income taxes, personal expenses, personal traits (e.g., hand span, stride length) and begin ongoing data collection (e.g., log book, journal) -display, analyse and interpret data useful to this course (e.g., gov't spending by different governments, accommodation gambling) -explore how data is related to proportional reasoning (using examples from environment, politics, art) and unit rates (e.g., fuel consumption)	<b>Filing Income Tax</b> -discuss types of incomes - determine information required to file a tax form -explore tax credits (must file to receive) - explore difference if you are self employed -examine tax services including Quick Tax -explore the consequences of making mistakes on your tax form or not completing in time	<b>Renting or Owning: Accommodation</b> • What are the pros and cons of living on your own? (financial, and non-financial) • investigate the landlord and tenant acts (websites) • describe the advantages and disadvantages of types of rentals • gather and compare purchase prices of different types of owned accommodation in the local community • explore living costs of renting or owning (include initial costs and moving)	<b>Designing Budgets</b> - define discretionary vs non-discretionary payments in context - define fixed vs variable expenses in context -interpret/ analyze/adjust budgets based on case studies -explore recommended proportion for items in budgets - create budgets based on case studies or personal data linked to career interests with and without technology	<b>Measurement</b> -construct a 2-D scale drawing - project budgets (renovation, furnish, personal or as a business - tender) -3-4-5 triangles (carpenter square) - building a sawhorse (3-D angles) - plans - construct a 3-D scale model - applications of perimeter, area, surface area, volume (rectangular, triangular, cylindrical prisms)	<b>Probability</b> - use simulations to generate experimental probability and compare to theoretical probability -explore the effects of sample size -examine probability and statistics in the media and make connections to decision making

Estimation, Measurement and Proportional Reasoning					
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
<b>Estimation:</b> -use hand span and stride length to collect estimated measurements  <b>Measurement:</b> -measure wrist and thumb circumference (in inches and cm) -compare measured data and statistical measurements  <b>Proportional Reasoning:</b> -use the proportion of wrist circumference to thumb circumference to compare metric and imperial measure	<b>Estimation:</b> -estimate refunds or payments on tax returns  <b>Proportional Reasoning:</b> -explore proportions of types of taxes in the context of “tax free” day	<b>Estimation:</b> -estimate costs of accommodation and moving using ranges of values found in the local community -compare estimated costs of owning various types of accommodation -compare estimated costs of renting various types of accommodation	<b>Estimation:</b> -estimate costs to prepare budgets  <b>Proportional Reasoning:</b> -explore the proportions of each item in a budget	<b>Estimation:</b> -estimate the materials and costs of a renovation  <b>Measurement:</b> -create scale drawings and a 3-D model -convert between imperial and metric measures -work with perimeter, area, volume and surface area  <b>Proportional Reasoning:</b> -convert between imperial and metric measures -connect Pythagorean triples to proportions -use proportional reasoning in context (mixtures)	<b>Estimation:</b> -estimate probability using simulations  <b>Proportional Reasoning:</b> -use proportional reasoning to apply statistics and help make informed decisions

## Rationale

### **Focus on Estimation, Measurement and Proportional Reasoning**

- Referring to these concepts in each unit helps students to consolidate their understanding.
- Uses the big ideas to help students make connections from unit to unit and with decision making

### **Starting with Interpreting and Displaying Data**

- A focus on data about the community and students in the class gives the teacher the information needed to choose contexts connected to students' interests, and needs and the community they live in throughout the course; it gives the students a sense of belonging to a learning community. Differentiating instruction based on interests helps students engage in what they are learning.
- Establishes a strong connection between data and proportional reasoning
- Introduces measurement data and explores ways to make better estimates when measuring

### **Unit 2: Filing Income Tax**

- Builds on concepts and skills learned in Unit one
- Allows the time needed to pre-order tax forms and arrange for a guest speaker, if desired
- Establishes the personal data that will be used for taxes and be followed up in the Designing Budgets unit.

### **Focus on Data**

- Units 1, 2, 3 and 4 focus on using real data about the students and their community, this enables students to make connections between their personal situation and the greater community, and to help them make informed decisions based on data

## Grade 12 Mathematics for Work and Everyday Life: Year Outline – Planning Tool

- P Number of pre-planned lessons (including instruction, diagnostic and formative assessments, summative assessments other than summative performance tasks)
- J Number of jazz days of time (instructional or assessment)
- T Total number of days
- SP Summative performance task (see Assessment – Grade 9 Applied)

Unit	Cluster of Curriculum Expectations	Overall and Specific Expectations	P	J	T	SP
1	<p>Personalize the course to capitalize on their interests and need of the mathematics in this course</p> <p>Collect, display and analyse data collected from the class and other sources using a variety of tools and strategies, and interpret and draw conclusions from the data</p> <p>Demonstrate the connection of data and the use of proportional reasoning and unit rates</p> <p>Work with examples using the overall themes of the course: estimation, measurement and proportional reasoning</p>	<p><b>RD1</b> collect, organize, represent, and make inferences from one-variable data using a variety of tools and strategies, and describe related applications;</p> <p><b>AM1</b> determine and estimate measurements using the metric and imperial systems, and convert measures within and between systems;</p> <p><b>AM3</b> identify and describe situations that involve proportional relationships and the possible consequences of errors in proportional reasoning, and solve problems involving proportional reasoning, arising in applications from work and everyday life.</p>	10	2	12	
2	<p>Reflect on the necessity of paying taxes and the uses of taxes as shown in the spending by various governments (municipal, provincial, federal)</p> <p>Prepare to file a tax return in the context of students' personal situations and the community, as well as from case studies</p> <p>Work with examples using the overall themes of the course: estimation, measurement and proportional reasoning</p>	<p><b>PF3</b> demonstrate an understanding of the process of filing a personal income tax return, and describe applications of the mathematics of personal finance.</p>	12	2	14	

Unit	Cluster of Curriculum Expectations	Overall and Specific Expectations	P	J	T	SP
3	<p>Personalize the course by referring to accommodations found in the local community.</p> <p>Compare the costs of owning various accommodations and the costs of renting various accommodations in the community</p> <p>Examine other expenses related to living accommodation and moving that are appropriate to the students</p> <p>Work with examples using the overall theme of estimation</p>	<p><b>PF1</b> gather, interpret, and compare information about owning or renting accommodation and about the associated costs;</p>	9	2	11	
4	<p>Personalize the course by having students design the class budget template, and use the template to create their own budgets</p> <p>Adjust budgets for changed circumstances</p> <p>Work with examples using the overall theme of estimation and proportional reasoning</p>	<p><b>PF2</b> interpret, design, and adjust budgets for individuals and families described in case studies</p> <p><b>AM3</b> identify and describe situations that involve proportional relationships and the possible consequences of errors in proportional reasoning, and solve problems involving proportional reasoning, arising in applications from work and everyday life</p>	11	2	13	

Unit	Cluster of Curriculum Expectations	Overall and Specific Expectations	P	J	T	SP
5	<p>Personalize the course by having students choose a type of renovation that most interests them</p> <p>Collect estimates and measurements related to a renovation project including preparing scale drawings, a 3-D model and creating a budget.</p> <p>Use proportional reasoning to convert units as appropriate to the context of the renovation and to solve problems as they arise in the project</p>	<p><b>AM1</b> determine and estimate measurements using the metric and imperial systems, and convert measures within and between systems;</p> <p><b>AM2</b> apply measurement concepts and skills to solve problems in measurement and design, to construct scale drawings and scale models, and to budget for a household improvement;</p> <p><b>AM3</b> identify and describe situations that involve proportional relationships and the possible consequences of errors in proportional reasoning, and solve problems involving proportional reasoning, arising in applications from work and everyday life.</p>	15	2	17	
6	<p>Personalize the course by investigating situations in the community or of student interest involving probability and statistics</p> <p>Use proportional reasoning to apply probability and statistics to real situations and make connections to decision making</p> <p>Use simulations to determine experimental probabilities, compare to theoretical probabilities and demonstrate the effect of large sample size</p>	<p><b>RD1</b> collect, organize, represent, and make inferences from one-variable data using a variety of tools and strategies, and describe related applications;</p> <p><b>RD2</b> determine and represent probability, and identify and interpret its applications.</p> <p><b>AM3</b> identify and describe situations that involve proportional relationships and the possible consequences of errors in proportional reasoning, and solve problems involving proportional reasoning, arising in applications from work and everyday life.</p>	11	2	13	
	Summative Performance Tasks				5	
	<b>Total Days</b>				<b>85</b>	

The number of prepared lessons represents the lessons that could be planned ahead based on the range of student readiness, interests, and learning profiles that can be expected in a class.



The extra time available for “instructional jazz” can be taken a few minutes at a time within a pre-planned lesson or taken a whole class at a time, as informed by teachers’ observations of student needs.

The reference numbers are intended to indicate which lessons are planned to precede and follow each other. Actual day numbers for particular lessons and separations between terms will need to be adjusted by teachers.

## **Mathematics for Work and Everyday Life: Toolkit**

Unit	Materials List
1	<ul style="list-style-type: none"> <li>• Community Data accessed from ESTAT</li> <li>• Frayer Model templates</li> <li>• Tape measures (metric and imperial)</li> <li>• Class sets: Collection showing a variety of graphs</li> <li>• Examples from media including examples of misuse</li> <li>• <i>An Inconvenient Truth</i>, <i>Shark Water</i>, if using these videos</li> </ul>
2	<ul style="list-style-type: none"> <li>• Income tax forms and guides</li> <li>• Electronic income tax, other internet sites</li> <li>• Case studies describing a person’s income, credits, and deductions</li> <li>• Guest speaker, if using</li> </ul>
3	<ul style="list-style-type: none"> <li>• Resources providing information about accommodations (e.g., real estate guides, apartment rentals ads, appropriate websites)</li> <li>• Copies (paper/electronic) of the Landlord and Tenants Act</li> <li>• Brochures, advertisements and flyers about moving</li> <li>• Collection of moving day “horror” stories</li> </ul>
4	<ul style="list-style-type: none"> <li>• Case studies to show examples of monthly spending</li> <li>• Program/chart/website to estimate mortgage payments (simple calculations that include taxes and insurance)</li> <li>• Case studies of budgets set in context at various phases of life and demonstrating various sources of income</li> <li>• Placemat and Frayer model for <i>budgets</i></li> </ul>
5	<ul style="list-style-type: none"> <li>• Blueprints</li> <li>• measuring tapes, rulers, trundle wheels, handspan/stridelength measurements, graph paper</li> <li>• materials for 3-D models</li> <li>• flyers from building and renovation centres</li> </ul>
6	<ul style="list-style-type: none"> <li>• prepare examples of probability in the media (weather, lotteries)</li> <li>• materials for simulations (pennies, dice, spinners, marbles, technology)</li> <li>• information on community promotions (roll up the rim to win)</li> </ul>

# Unit 1: Interpreting and Displaying Data

## Lesson Outline

### BIG PICTURE

Students will:

Read, interpret, various graphs

Collect data and construct and interpret appropriate graphs

Explore how data is related to proportional reasoning and unit rates

Day	Lesson Title	Math Learning Goals	Expectations
1	About our community	<ul style="list-style-type: none"> <li>Explore characteristics of your community based on data retrieved from ESTAT</li> <li>Discuss representation of the community characteristics in the classroom using proportional reasoning.</li> <li>Explain the distinction between the terms population and sample.</li> <li>Start word wall.</li> </ul>	RD1.2, RD1.3, AM3.3
2	About ourselves	<ul style="list-style-type: none"> <li>Collect data from the class. (e.g. employment, income, type of accommodation, language, number of pets, eye colour, wrist and thumb circumference, hand span, stride length)</li> <li>Discuss primary data vs secondary data. Add terms to word wall.</li> <li>Revisit the concepts of population and sample.</li> <li>Discuss why samples are used.</li> </ul>	RD1.3, RD1.2,
3	All about graphs	<ul style="list-style-type: none"> <li>Sort a collection of various graphs and explain criteria used. (e.g. group activity)</li> <li>Establish terminology for the sort (e.g. bar graph, circle graph, line graph, histogram, categorical data, ordinal data, continuous data). Add terms to the word wall.</li> <li>Refine process resorting as necessary. (eg. separating bar graphs and histograms)</li> <li>Interpret the graphs in your collection based on the sorting criteria.</li> </ul>	RD1.1
4, 5	Which graph is best?	<ul style="list-style-type: none"> <li>Describe the characteristics and uses of the various types of graphs.</li> <li>Display categorical data appropriately, including data collected on Day 2 with and without technology. (e.g. eye colour)</li> <li>Distinguish between categorical and ordinal data. (e.g. type of pets versus number of pets)</li> </ul>	RD1.3, RD1.4
6	What is data good for?	<ul style="list-style-type: none"> <li>Brainstorm why we collect data and what it is used for.</li> <li>Connect with how the media uses data.</li> <li>Discuss the misuse of data. (e.g. distorted graphs)</li> </ul>	RD1.7, RD1.5
7	Data collection using estimation	<ul style="list-style-type: none"> <li>Use the hand span and stride length (both imperial and metric) to estimate measures of items in the school environment as an example of how data can be used.</li> <li>Record the number of hand spans and stride lengths</li> </ul>	RD1.8, AM1.5

		<p>for various objects in a table.</p> <ul style="list-style-type: none"> <li>• Complete the table to include both imperial and metric measures for each item.</li> <li>• Create a comparison bar graph that displays some of the items measured. (Horizontal axis - object Vertical axis – numeric scale that represents both the number of inches and the number of centimetres; Bar 1: cm, Bar2: inches)</li> <li>• Use the graph to discuss the proportional relationship that exists between centimetres and inches.</li> </ul>	
8	Let's get converted	<ul style="list-style-type: none"> <li>• Use the proportional relationship from Day 7 to perform some conversions.</li> <li>• Explore other conversions.</li> </ul>	AM1.2, AM1.4, AM1.5, AM3.2
9	Unit rate data	<ul style="list-style-type: none"> <li>• Work with data that is given as unit rates. (eg. grocery store, gas consumption, currency exchange)</li> </ul>	RD1.8, AM3.2
10	Jazz	<ul style="list-style-type: none"> <li>•</li> </ul>	
11	Assessment for Learning	<ul style="list-style-type: none"> <li>• Self-assessment</li> <li>• Start personal data collection log</li> </ul>	

## Unit 2: Mathematics for Work and Everyday Life

### Lesson Outline

#### BIG PICTURE

Students will:

Complete a simple personal income tax return with or without tax preparation software (e.g. Quick Tax, [www.intuit.ca](http://www.intuit.ca))

Gather, interpret, and describe information about applications of the mathematics of personal finance in the workplace and home.

Day	Lesson Title	Math Learning Goals	Expectations
1	Why Taxes?	<ul style="list-style-type: none"> <li>Brainstorm reasons why we pay taxes generally and income taxes specifically.</li> <li>Discuss why Canadians are expected to file income tax and its collection and usage</li> <li>Discuss tax-free day to explore proportion of types of taxes</li> <li>Connect with data analysed in Unit 1 (e.g. government expenditures)</li> </ul>	P.F.3.1
2	Documentation: Page 1 of the Tax Form	<ul style="list-style-type: none"> <li>Explore types of information that the government requires and how it relates to the design of the income tax forms.</li> <li>Identify documentations that support the completion of the form (e.g. guides) and where to obtain them (general and simplified).</li> </ul>	PF3.1, PF3.2, PF3.6
3	Income: Page 2 of the Tax Form	<ul style="list-style-type: none"> <li>Interpret and describe information about income contained on a T4 slip.</li> <li>Connect the income information on the T4 slip with the tax form.</li> <li>Discuss and complete most likely sources of income on the tax form that are relevant to students based on the community.(eg. self employment such as baby sitting, grass cutting, Student Welfare, Native Students)</li> </ul>	PF3.1, PF3.2, PF3.4, PF3.7
4,5	Exploring Tax Credits	<ul style="list-style-type: none"> <li>Explore in groups and report on a Tax Credit (Charitable Donations, Medical Expenses, Political Donations, Disability Allowance, Tuition, GST, moving, child care, rental/property tax, etc.)</li> </ul>	PF3.1, PF3.2, PF3.3, PF3.4, PF3.7
6	Refund or Payment? Page 3,4 of Tax Form	<ul style="list-style-type: none"> <li>Discuss and complete estimating the most likely income deductions and tax credits on the tax form, including schedules that are relevant to students based on the community. (e.g. Child Care, Dependents, Native Status, Community- Northern Allowance)</li> <li>Determine the amount of refund or amount owing and discuss how payment is made.</li> </ul>	PF3.1, PF3.2, PF3.3, PF3.4, PF3.7
7	<i>Consolidation</i>	<ul style="list-style-type: none"> <li>Complete the income tax form for a case study to consolidate days 1-6.</li> </ul>	PF3.1, PF3.2, PF3.3, PF3.4, PF3.7
8	Business Tax Implications	<ul style="list-style-type: none"> <li>Use appropriate forms (e.g. T2124 – Business Activities) in the context of case studies, to explore the tax implications of self employment. (Note: Share case studies appropriate to student/community)</li> </ul>	PF 3.2, PF3.3, PF3.4, PF3.5, PF3.7

9	Income tax services	<ul style="list-style-type: none"> <li>• Gather, interpret, and describe information about services that complete personal income tax returns</li> <li>• Discuss methods of filing a tax return.</li> <li>• Identify services available to assist with tax returns within the community.</li> </ul> (Optional: Guest speaker)	P.F3.6
10, 11		<ul style="list-style-type: none"> <li>• Use students' own data or a variety of case studies to complete income tax returns.</li> </ul>	PF3.2, PF3.3, PF3.4, PF3.5, PF3.5, PF3.6, PF3.7
12, 13	Jazz Day Summative Task	<ul style="list-style-type: none"> <li>• Use a case study and the completed tax return to identify appropriate changes that would take advantage of unused tax benefits and develop a plan which reflects these changes.</li> </ul>	PF3.2, PF3.3, PF3.4, PF3.5, PF3.5, PF3.6, PF3.7

## Unit 3: Mathematics for Work and Everyday Life

### Lesson Outline

#### BIG PICTURE

Students will:

Create a bulletin board and word wall that develops over the unit, focusing on the concepts of this unit

Gather, interpret, and compare advantages and disadvantages associated with owning and with renting

Demonstrate an understanding of various types of costs: fixed, variable, one-time, ongoing

Explore the tasks and costs involved with moving

Day	Lesson Title	Math Learning Goals	Expectations
1	Where can we live?	<ul style="list-style-type: none"> <li>Create a mind map of various types of accommodations. (Think)</li> <li>Research various resources and revise mind map. (Pair)</li> <li>Consolidate into various types of accommodations. (Share)</li> </ul> (Introduce the bulletin board project by organizing general headings from the mind map and direct students to find examples of accommodations)	PF 1.2, PF1.3
2	Being responsible	<ul style="list-style-type: none"> <li>Brainstorm to identify financial and non-financial implications of being responsible for your own accommodations (collect examples for the bulletin board)</li> <li>Refer to the mind map and the brainstorm session to determine/revise and post titles to the bulletin board.</li> <li>Clarify unfamiliar terms and post on the word wall (e.g. duplex)</li> </ul>	PF. 1.1, PF1.2, PF1.3
3	Setting up the bulletin board	<ul style="list-style-type: none"> <li>Analyze and sort examples of accommodations to display on bulletin board by type. (e.g. post one example of renting an apartment and include other examples of renting an apartment in an envelope on the bulletin board that can be accessed for further activities.)</li> <li>Connect estimated costs of accommodation with the type of accommodation (e.g., ranges of rent, and purchase prices)</li> <li>Post estimated cost ranges on bulletin board for each of the accommodation types</li> </ul>	PF.1.2, PF1.3
4	Think about expenses	<ul style="list-style-type: none"> <li>Gather, and interpret information of other accommodation expenses (e.g. rental/utility deposit, cable, groceries).</li> <li>Classify estimated costs between one time vs. on-going, and fixed vs. variable.</li> <li>Clarify terminology and update the word wall.</li> </ul>	PF. 1.4
5	Do we want to own?	<ul style="list-style-type: none"> <li>Identify common costs that are clearly common to both owning and renting an accommodation. Update bulletin board.</li> <li>Establish costs associated that are unique to purchasing/owning (e.g. one-time: legal fees, sales tax; fixed: mortgage payment, property taxes; variable: upkeep).</li> </ul>	PF. 1.2, PF1.3, PF1.4

		Update bulletin board. <ul style="list-style-type: none"> <li>Summarize advantages and disadvantages of owning various types of accommodations.</li> </ul>	
6,7	Do we want to rent?	<ul style="list-style-type: none"> <li>Establish costs associated that are unique to renting (e.g. one-time: damage deposit; fixed cost: rent, parking, storage; variable: laundry). Update bulletin board.</li> <li>Anticipate the rights and responsibilities of tenants and landlords. Verify through a scavenger hunt of printed and/or on-line resources.</li> <li>Summarize advantages and disadvantages of renting various accommodations.</li> </ul>	PF. 1.2, PF1.4, PF1.5
8	Moving Day	<ul style="list-style-type: none"> <li>Explore through a carousel the various tasks involved in moving. (e.g. setting up/disconnecting services; packing/transportation; paperwork-address change, follow up; special considerations: moving out-of-province, coordinating events, storage; horror stories: house not built yet on moving day, previous tenant refusing to leave when lease had expired)</li> <li>Consolidate by creating a task checklist.</li> </ul>	PF. 1.6
9,10	Jazz Day Summative Task	<ul style="list-style-type: none"> <li>Reflect on the unit to highlight the key elements that must be considered for selecting accommodation and moving in.</li> </ul>	

## Unit 4: Mathematics for Work and Everyday Life

### Lesson Outline

#### BIG PICTURE

Students will:

Refer to and expand on the bulletin board/word wall developed in unit 3 to support the concepts of this unit.

Day	Lesson Title	Math Learning Goals	Expectations
1	I must pay, I could pay	<ul style="list-style-type: none"> <li>Establish a definition of discretionary and non-discretionary spending using the items on the bulletin board as a starting point</li> <li>Expand the bulletin board to include expenses not related to accommodations and classify these as discretionary and non-discretionary</li> <li>Create a graphic organizer to classify discretionary and non-discretionary expenses as fixed or variable expenses</li> </ul>	PF 2.1, PF 2.2
2	What do you think: must or could?	<ul style="list-style-type: none"> <li>Analyze case studies to determine which items are contextually discretionary vs. non-discretionary.</li> <li>Defend their understanding of the terms to prove or refute generalizations.</li> </ul>	PF. 2.1, PF2.2
3	What is a Budget?	<ul style="list-style-type: none"> <li>Prepare a placemat on the concept of budget.</li> <li>Consolidate with a class Frayer Model of a budget.</li> <li>Brainstorm connections between the graphic organizer (Day 1) and the Frayer model</li> <li>Design a budget template.</li> </ul>	PF. 2.3, PF2.4
4	More on budgets	<ul style="list-style-type: none"> <li>Analyse (e.g. use case studies, Jigsaw groupings) a variety of budgets set in context in various phases of a person's life, (e.g. single, married, with children, retired) and various sources/levels of income (e.g. employment, welfare, unemployment)</li> <li>Modify budget template based on analysis.</li> </ul>	PF. 2.3, PF2.4
5	Paying for accommodation	<ul style="list-style-type: none"> <li>Identify and describe the factors to be considered in determining the affordability of accommodation in the local community.</li> <li>Discuss the need to consider a monthly payment for owning that includes mortgage payment, property taxes, and house insurance.</li> <li>Estimate monthly payments by type of owned accommodation within the local community. (Refer to data on the bulletin board.)</li> <li>Discuss the proportion of the monthly budget that should be allocated to accommodation</li> </ul>	PF. 2.5
6	Preparing budgets	<ul style="list-style-type: none"> <li>Prepare monthly budgets based on given case studies with and without technology.</li> <li>Explore the proportions of each item in the budget</li> </ul>	PF. 2.4



7	That changes it	<ul style="list-style-type: none"> <li>• Adjust monthly budgets based on changes of circumstance for the case studies with and without technology.</li> </ul>	PF. 2.6
8 - 12	Career Search Culminating Task for Units 2,3,4	<ul style="list-style-type: none"> <li>• Investigate a career of choice.</li> <li>• Estimate likely net income from the career based on tax and other deductions.</li> <li>• Develop a detailed monthly budget with rationale. (may be able to connect to Unit 1 for part of the rationale.)</li> </ul>	

# Unit 5: Mathematics for Work and Everyday Life

## Lesson Outline

### BIG PICTURE

Students will:

- Plan, design, draw scale drawings, prepare a budget for a household improvement
- Construct a three dimensional model
- Estimate and calculate perimeter, area, volume, and surface area
- Convert measures within and between systems

Day	Lesson Title	Math Learning Goals	Expectations
1	Let's make it better	<ul style="list-style-type: none"> <li>• Identify the types of renovations that people will undertake to create a better living environment for themselves through a guest speaker or video (i.e. residence and landscaping)</li> <li>• Identify reasons why people renovate</li> </ul>	AM 2.8
2	Do we need it?	<ul style="list-style-type: none"> <li>• Brainstorm through a graffiti exercise what possible renovations people would do for various projects (e.g. bedroom, bathroom, backyard, front yard, house exterior, additions) and what it entails (e.g. removal of trees or walls before construction occurs)</li> <li>• Discuss needs versus wants for renovations (e.g. changing the roof because it leaks or because it will look better?)</li> </ul>	AM2.8
3,4	Getting ready to renovate	<ul style="list-style-type: none"> <li>• Establish a framework for a renovation project (e.g., form groups based on a renovation type)</li> <li>• Research and collect measurement data for the renovation. (e.g., groups collect all required measurements/estimates)</li> <li>• Create a first draft two-dimensional scale drawing for the renovation on grid paper. (e.g. bedroom floor plan, landscaping area, deck)</li> </ul>	AM2.8, AM2.6, AM3.3, AM3.5
5	What about perimeter?	<ul style="list-style-type: none"> <li>• Identify the perimeter concepts from the graffiti exercise that will be used for the renovation. Share with class.</li> <li>• Establish norms for units to be used. (feet and inches, or meters and centimetres)</li> <li>• Estimate and calculate a variety of perimeters required by the renovation. Make any necessary conversions.</li> <li>• Adjust scale drawing if necessary.</li> </ul>	AM 2.2, AM2.6, AM1.2, AM1.4, AM1.5, AM3.3, AM3.5
6	What about area?	<ul style="list-style-type: none"> <li>• Develop the formulae for the area of basic 2-D shapes (e.g. rectangles, triangles, circle)</li> <li>• Identify the area concepts from the graffiti exercise that will be used within the renovation. Share with class.</li> <li>• Estimate and calculate a variety of areas required by the renovation. Make any necessary conversions.</li> <li>• Adjust scale drawing if necessary.</li> </ul>	AM. 2.3, AM2.4, AM2.6, AM1.2, AM1.4, AM1.5, AM3.3, AM3.5
7	What about volume?	<ul style="list-style-type: none"> <li>• Develop the volume formulae based on the area of the base from Day 6.</li> <li>• Investigate volumes of irregular shapes (e.g. L-shaped swimming pool)</li> </ul>	AM 1.2, AM2.3, AM2.5

8	More on volume	<ul style="list-style-type: none"> <li>Identify volume concepts from the graffiti exercise that will be used within the renovation. (e.g. movement of earth, adding/moving structures to the room, changing the capacity of the air in the room, changing to an environmentally friendly toilet, pouring concrete)</li> <li>Estimate and calculate a variety of volumes required by the renovation. Make any necessary conversions.</li> </ul>	AM 2.3, AM2.5, AM1.2, AM1.4, AM1.5
9	About surface area	<ul style="list-style-type: none"> <li>Develop surface area formulae based on the composite figures from Day 7 and 8.</li> </ul>	AM 2.5
10	More on surface area	<ul style="list-style-type: none"> <li>Identify surface area concepts from the graffiti exercise that will be used within the renovation. (e.g. painting walls that have windows and doors)</li> <li>Estimate and calculate a variety of surface areas required by the renovation. Make any necessary conversions.</li> </ul>	AM 2.5, AM1.2, AM1.4, AM1.5
11	Let's build it	<ul style="list-style-type: none"> <li>Illustrate the construction of a 3-D model that encompasses the construction of a right angle and proportional reasoning. (e.g. 9-40-41 Pythagorean triplet for a wheel chair ramp, 5-12-13 Pythagorean outdoor stairs, verify right angles using 3-4-5 triplet)</li> <li>Construct a 3-D model of a familiar item from the renovation.</li> </ul>	AM2.1, AM2.7, AM3.1, AM3.3, AM3.5
12	So what's it going to cost?	<ul style="list-style-type: none"> <li>Research the cost of materials and labour for the renovation. (e.g., cost of labour and disposal of materials for the removal of a wall)</li> <li>Estimate the amount of material required for the project and round in context. Make any necessary conversions.</li> <li>Create an itemized list of materials in both metric and imperial.</li> </ul>	AM 2.8, AM1.2, AM1.3, AM1.4, AM1.5, AM3.2, AM3.3
13-15	Completing the Project Proposal Summative	<ul style="list-style-type: none"> <li>Write up a proposed plan for the renovation.</li> <li>Consolidate or finalize drawings for the renovation.</li> <li>Prepare the budget.</li> <li>Submit the proposal that includes the plan, drawings and the budget.</li> </ul>	AM 2.8, AM3.6

# Unit 6: Mathematics for Work and Everyday Life

## Lesson Outline

### BIG PICTURE

Students will:

- Collect experimental data to determine experimental probabilities and compare to theoretical probability
- Demonstrate an understanding of the effect of sample size on statistics
- Interpret statistics and probability used in the media to make informed decisions
- Use understanding of probability to analyse and issue or promotion in the community

Day	Lesson Title	Math Learning Goals	Expectations
1	Is the “World Series” fixed?	<ul style="list-style-type: none"> <li>• Explore the possibility that the “World Series” in baseball is fixed by simulating the series tossing coins to track wins and losses (pairs, 20 trials)</li> <li>• Demonstrate the effect of sample size by combining class results</li> <li>• Compare bar graph of experimental data to actual World Series data and discuss how this relates to whether or not the World Series is fixed</li> </ul>	RD2.1, RD2.3, RD1.1, RD1.2, RD1.5, RD1.6, RD1.7, RD1.8
2	Is it based on chance?	<ul style="list-style-type: none"> <li>• Summarize the activity in day one by defining and distinguishing between theoretical and experimental probability</li> <li>• Place new terms on the word wall</li> <li>• Discuss the current concerns about issues based on chance (e.g. too many vendors winning the lottery and compare to discussion of World Series and using simulations)</li> <li>• Explore other examples in the media</li> </ul>	RD2.1, RD2.2, RD1.8
3	Experimenting	<ul style="list-style-type: none"> <li>• Perform a series of probability experiments to collect data (e.g., partners in carousel featuring: spinners, aboriginal stick-and-stone, dice, coins, drawing cards, picking marbles, rock paper scissors, including using technology)</li> <li>• Compile class data to examine the effect of sample size and compare to the theoretical probability (Could be supplied by teacher) of each experiment</li> </ul>	RD2.1, RD2.3, RD2.4, RD2.5, RD1.7
4	We’re getting closer	<ul style="list-style-type: none"> <li>• Explore the tendency of the experimental probability to approach the theoretical probability as the number of trials increases using technology-based simulations (e.g. graphing calculators, spreadsheets, computer simulations)</li> </ul>	RD2.5, RD1.2, RD1.5, RD1.6, RD1.7
5, 6	We need to make informed decisions	<ul style="list-style-type: none"> <li>• Brainstorm choices we make that involve chance (weather, smoking, riding with an impaired driver, lotteries and gambling)</li> <li>• Discuss uncertainty with respect to the difference of experimental and theoretical probability</li> <li>• Apply probability to large numbers (e.g., hospital lotteries)</li> <li>• Interpret the information of statistics used in the media to make decisions</li> <li>• Reflect on subjective interpretation of statistics (e.g., 1 in 5 chance of winning a lottery compared to 1 in 5 chance of getting cancer)</li> <li>• Apply proportional reasoning using statistics and identify</li> </ul>	RD2.4, RD2.6, AM3.3, AM3.4

		benefits and consequences to decision making	
7	How does it really work?	<ul style="list-style-type: none"> <li>• Use understanding of probability to explore a current/local issues in the community (environment, health, gambling)</li> </ul>	RD2.6, AM3.3, AM3.4
8-12	<i>Jazz /Summative</i>	<ul style="list-style-type: none"> <li>• Analyse a promotional lottery in the community (e.g., new car buyers have a chance to win, “roll-up-the-rim-to-win” promotions, bottle cap promotions, set of prizes in cereal boxes)</li> </ul>	