
Coded Expectations, Locally Developed Compulsory Credit Course, Mathematics, Grade 10, MAT2L

Extending Money Sense

Overall Expectations

By the end of this course, students will:

EMSV.01 • solve problems drawn from everyday situations involving money, demonstrating skill and understanding in the use of decimal numbers;

EMSV.02 • communicate information about money sense;

EMSV.03 • use literacy skills (reading, writing, listening, and speaking) to extend their money sense.

Specific Expectations

Understanding and Using Decimal Numbers in Solving Problems

By the end of this course, students will:

EMS1.01 – read and interpret money values given in words, write money values as decimals, and round money values appropriately, in solving problems found in everyday contexts;

EMS1.02 – explain the meaning of negative numbers as they apply to money (e.g., a negative amount may mean that you owe money or that you have spent more than you budgeted for), and use them to solve problems involving money;

EMS1.03 – interpret numerical data drawn from the media and explain its significance using other number references (e.g., An athlete earned \$850 000 last year. How many people could that much money feed in a developing nation?);

EMS1.04 – demonstrate the effective use of a calculator in operations with decimals;

EMS1.05 – judge the reasonableness of calculations involving decimals through estimation;

EMS1.06 – solve problems involving sales tax, discounts, restaurant tips, and commission earnings (e.g., A skateboard costs \$49.99 before taxes. You have \$60.00. Do you have enough to buy the skateboard? Justify your answer);

EMS1.07 – investigate and identify possible part-time jobs, determine hourly rates of pay, and calculate possible weekly, monthly, and yearly total incomes;

EMS1.08 – solve problems involving the accomplishment of a particular goal, including investigating, planning, gathering, and organizing data, and making relevant calculations (e.g., plan a special event within a given budget).

Communicating Information About Money

By the end of this course, students will:

EMS2.01 – verbalize their observations and reflections regarding money sense and ask questions to clarify their understanding (e.g., talk about their own and other students' solutions to problems);

EMS2.02 – explain their reasoning used in problem solving and in judging reasonableness;

EMS2.03 – communicate, orally and in writing, the solutions to money problems and the results of investigations, using appropriate terminology, symbols, and form.

Extending Understanding of Measurement

Overall Expectations

By the end of this course, students will:

- EUMV.01** • make estimates and measurements to extend understanding of the metric system;
- EUMV.02** • make estimates and measurements to extend understanding of the imperial system;
- EUMV.03** • solve problems involving measurements of circles, rectangles, cylinders, and rectangular prisms, using metric units in applications drawn from everyday life and the workplace;
- EUMV.04** • communicate information about measurement concepts;
- EUMV.05** • use literacy skills (reading, writing, listening, and speaking) to extend understanding of measurement.

Specific Expectations

Estimating and Measuring Using the Metric System

By the end of this course, students will:

- EUM1.01** – demonstrate accuracy in measuring length, capacity, and mass in everyday applications, using appropriate tools, and record the measurements using the correct abbreviations for metric units;
- EUM1.02** – solve problems drawn from everyday applications requiring the conversion between commonly used metric units;
- EUM1.03** – estimate, using standard units, measurements of length, capacity, and mass that arise from their everyday experience (e.g., the distance from school to the motor vehicle office is about 15 km; the mass of the refrigerator is about 75 kg; the capacity of a gasoline tank is about 60 L);
- EUM1.04** – read and use schedules to solve problems (e.g., bus, train, or airline schedules);
- EUM1.05** – read, write, and interpret dates, using a specified numerical format (e.g., Oct. 5, 2007 can be written as 5/10/07);
- EUM1.06** – solve problems to determine the elapsed time between two given dates or two given times (e.g., number of days between two given dates, elapsed time in hours between two different time zones);
- EUM1.07** – identify and use personal referents to aid in the estimation of temperature (e.g., an outside temperature of 22°C is comfortable, but 33°C is a very hot day);
- EUM1.08** – describe applications from everyday life and the workplace that involve a combination of perimeter, area, volume, mass, capacity, time, and/or money (e.g., a landscaping project may require the use of perimeter for purchasing fencing, area for purchasing sod, volume for purchasing soil, and require the job to be completed within a specified time).

Estimating and Measuring Using the Imperial System

By the end of this course, students will:

- EUM2.01** – measure length in feet and inches, to accuracies of $\frac{1}{8}$ inch and $\frac{1}{16}$ inch, using tape measures and 12-inch rulers;
- EUM2.02** – record linear measurements, using commonly accepted abbreviations for the chosen units (e.g., 3 yards could be written as 3 yd.; 11 miles could be written as 11 mi.);
- EUM2.03** – make estimates and accurate measurements of length in the imperial system to construct a model (e.g., a rectangular prism constructed from cardboard to given dimensions; a scale model of a room);
- EUM2.04** – explore and identify approximate relationships between non-linear units of measure in the metric and imperial systems (e.g., gallons and litres, kilograms and pounds, litres and cups).

Solving Problems Involving Circumference, Perimeter, Area, and Volume

By the end of this course, students will:

- EUM3.01** • identify the parts of a circle, using the correct terminology (e.g., centre, radius, diameter, circumference);
- EUM3.02** – determine an approximate value for π (Pi) by investigating the relationship between the circumference and the diameter of a circle, using concrete materials to obtain measurements;
- EUM3.03** – validate the formula for the circumference of a circle by comparing measurements of the circumference to the calculations, using the formula $C = \pi d$;
- EUM3.04** – solve authentic problems requiring the calculation of the circumference of a circle;
- EUM3.05** – solve authentic problems requiring the calculation of the perimeter of composite figures made up of straight line segments and half- and quarter-circles;
- EUM3.06** – estimate the size of a given angle by comparing it to angles of 30° , 45° , 60° , 90° , 180° , or 360° ;
- EUM3.07** – estimate and calculate the areas of circles and fractions of circles drawn from applications in the environment;
- EUM3.08** – validate the formula for the area of a circle by comparing approximate measurements of the area to the calculations, using the formula $A = \pi r^2$ (e.g., measure the area and radius of several circles, using concrete materials);
- EUM3.09** – construct reasonably accurate diagrams of the angles 180° , 90° , 45° , 30° , and 60° , by dividing a given circle into the appropriate number of parts (e.g., to construct an angle of 45° , divide a given circle into eight equal parts);
- EUM3.10** – solve authentic problems requiring the calculation of the areas of composite figures made up of rectangles and half- or quarter-circles;
- EUM3.11** – establish that the volume of a cylinder is found by multiplying the area of its base by its height by comparing the structure of a prism to that of a cylinder (e.g., the top and bottom are identical and the sides are perpendicular to the top and bottom);
- EUM3.12** – solve problems drawn from everyday situations involving the perimeters and the areas of circles and rectangles, and the volumes of cylinders and rectangular prisms.

Communicating Information About Measurement

By the end of this course, students will:

- EUM4.01** – organize measurement information, using a simple framework (e.g., template, form, graphic organizer, chart, electronic spreadsheet); draw conclusions from this data; and make decisions based on it;
- EUM4.02** – verbalize their observations and reflections regarding measurements and ask questions to clarify their understanding (e.g., talk about their own and other students' solutions to problems);
- EUM4.03** – explain their reasoning used in problem solving and in judging reasonableness;
- EUM4.04** – communicate, orally and in writing, the solutions to measurement problems and the results of investigations, using appropriate terminology, symbols, and form.

Extending Understanding of Proportional Reasoning

Overall Expectations

By the end of this course, students will:

EPRV.01 • solve problems drawn from everyday situations, demonstrating skill and understanding in the use of fractions, percentages, ratios, and rates;

EPRV.02 • communicate information drawn from a variety of sources;

EPRV.03 • use literacy skills (reading, writing, listening, and speaking) to extend understanding of proportional reasoning.

Specific Expectations

Applying Fractions, Percent, Ratio, and Rate in Solving Problems

By the end of this course, students will:

EPR1.01 – determine the relationships among fractions, decimals, and percentages by constructing diagrams and building models;

EPR1.02 – recall from memory the most commonly used equivalences or approximations between fractions and percentages (e.g., $\frac{1}{4} = 25\%$, $\frac{1}{3} \doteq 33\%$, $\frac{1}{2} = 50\%$, $\frac{2}{3} \doteq 67\%$, $\frac{3}{4} = 75\%$, and $1 = 100\%$);

EPR1.03 – solve problems involving the most commonly used equivalences between fractions and percentages (e.g., An item selling for \$43.99 is 25% off. That’s about $\frac{1}{4}$ off \$40. So I should save about $40 \div 4 = \$10$, or a little more than \$10);

EPR1.04 – round decimal values appropriately in solving problems drawn from everyday situations;

EPR1.05 – solve problems involving fractions and percentages in practical situations (e.g., sales tax, discounts, restaurant tips, and commission earnings), by converting to decimals and using a calculator where appropriate;

EPR1.06 – measure areas of personal interest, using metric or imperial units, and construct scale diagrams, using grid paper;

EPR1.07 – write ratios describing relationships in the school environment (e.g., the ratio of silver cars to white cars in the parking lot today is 7:15);

EPR1.08 – describe the effects of changing the parts of a given ratio proportionately and disproportionately in activities in which the results are observable (e.g., mixing paint, mixing drywall compound, mixing cement, mixing punch, distorting a picture on a computer by enlarging or reducing in one direction only);

EPR1.09 – solve problems using proportions (e.g., In making punch, the ratio of fruit juice to water is 1:3. How much water should be added if you have 3 litres of fruit juice?);

EPR1.10 solve problems involving the calculation of rates drawn from a variety of everyday contexts and from familiar social issues (e.g., the mass of garbage produced per person in a month, the number of plastic bags consumed by a family in a year).

Communicating Information

By the end of this course, students will:

EPR2.01 – read, interpret, and explain, orally and in writing, data displayed in tables and graphs;

EPR2.02 – construct a variety of graphs (straight line, bar, circle), with and without the use of technology, to assist in identifying patterns in data or drawing conclusions from data;

EPR2.03 – identify graphs that misrepresent data and explain why the graphs are misleading.