

Ontario Curriculum Correlation: Grade 8

JUMP_{Math}

Contents

Number Sense and Numeration	3
Measurement	6
Geometry and Spatial Sense	8
Patterning and Algebra	10
Data Management and Probability	12



jump math™
MULTIPLYING POTENTIAL.

Copyright © 2010 JUMP Math

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without written permission from the publisher, or expressly indicated on the page with the inclusion of a copyright notice.

JUMP Math

Toronto, Ontario

www.jumpmath.org

Notes

To ensure that the curriculum is fully covered, use the worksheets with the lessons plans in the Teacher's Guide.

Underlined lesson numbers indicate relevant preparatory exercises.

OCUP: Ontario Curriculum Unit Planner

JUMP Math workbook units are represented by:

- NS Number Sense
- PA Patterns and Algebra
- ME Measurement
- G Geometry
- PDM Probability and Data Management

Number Sense and Numeration

Overall Expectations

By the end of Grade 8, students will:

OCUP Code	Overall Expectation
8m8	represent, compare, and order equivalent representations of numbers, including those involving positive exponents;
8m9	solve problems involving whole numbers, decimal numbers, fractions, and integers, using a variety of computational strategies;
8m10	solve problems by using proportional reasoning in a variety of meaningful contexts.

Quantity Relationships

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m11	express repeated multiplication using exponential notation;	2	5:NS	104, 105
8m12	represent whole numbers in expanded form using powers of ten;	2	5:NS	106
8m13	represent, compare, and order rational numbers (i.e., positive and negative fractions and decimals to thousandths);	1	1:NS	<u>35</u> , <u>36</u> , <u>38</u> , 39, 57
		2	1:NS	85–87
		2	5:NS	110
8m14	translate between equivalent forms of a number (i.e., decimals, fractions, percents);	1	1:NS	<u>34</u> , <u>37</u> , 39
		2	1:NS	75, 76, 85–87, 96
		2	5:NS	110
8m15	determine common factors and common multiples using the prime factorization of numbers.	1	1:NS	<u>1–4</u> , 5, 6

Operational Sense

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m16	solve multi-step problems arising from real-life contexts and involving whole numbers and decimals, using a variety of tools and strategies;	1	1:NS	57
8m17	solve problems involving percents expressed to one decimal place and whole-number percents greater than 100;	2	1:NS	91–95
8m18	use estimation when solving problems involving operations with whole numbers, decimals, percents, integers, and fractions, to help judge the reasonableness of a solution;	1	1:NS	25, 26, 30, 33, 43–45, 50–57
		2	1:NS	85–89, 94, 95, 103
8m19	represent the multiplication and division of fractions, using a variety of tools and strategies;	1	1:NS	23–33
8m20	solve problems involving addition, subtraction, multiplication, and division with simple fractions;	1	1:NS	19, 21, 22, 24, 26, 29–33
8m21	represent the multiplication and division of integers, using a variety of tools;	1	7:NS	72–74
8m22	solve problems involving operations with integers, using a variety of tools;	1	7:NS	72–74
8m23	evaluate expressions that involve integers, including expressions that contain brackets and exponents, using order of operations;	2	5:NS	107–109
8m24	multiply and divide decimal numbers by various powers of ten;	1	1:NS	46–52, 56
		2	6:ME	15
8m25	estimate, and verify using a calculator, the positive square roots of whole numbers, and distinguish between whole numbers that have whole-number square roots (i.e., perfect square numbers) and those that do not.	1	3:NS	58–63

Proportional Relationships

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m26	identify and describe real-life situations involving two quantities that are directly proportional;	2	1:NS	98, 99, 101–103
8m27	solve problems involving proportions, using concrete materials, drawings, and variables;	1	6:ME	3, 4
		2	1:NS	90, 92, 97–99
8m28	solve problems involving percent that arise from real-life contexts;	2	1:NS	85–89, 92–95
8m29	solve problems involving rates.	2	1:NS	101–103

Measurement

Overall Expectations

By the end of Grade 8, students will:

OCUP Code	Overall Expectation
8m30	research, describe, and report on applications of volume and capacity measurement;
8m31	determine the relationships among units and measurable attributes, including the area of a circle and the volume of a cylinder.

Attributes, Units, and Measurement Sense

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m32	research, describe, and report on applications of volume and capacity measurement.	2	6:ME	14

Measurement Relationships

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m33	solve problems that require conversions involving metric units of area, volume, and capacity (i.e., square centimetres and square metres; cubic centimetres and cubic metres; millilitres and cubic centimetres);	2	6:ME	15
8m34	measure the circumference, radius, and diameter of circular objects, using concrete materials;	1	6:ME	5, 6
8m35	determine, through investigation using a variety of tools and strategies, the relationships for calculating the circumference and the area of a circle, and generalize to develop the formulas [i.e., Circumference of a circle = $\pi \times \text{diameter}$; Area of a circle = $\pi \times (\text{radius})^2$];	1	6:ME	6, 7
8m36	solve problems involving the estimation and calculation of the circumference and the area of a circle;	1	6:ME	7, 8

Measurement Relationships (continued)

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m37	determine, through investigation using a variety of tools and strategies, the relationship between the area of the base and height and the volume of a cylinder, and generalize to develop the formula (i.e., Volume = area of base x height);	2	6:ME	13
8m38	determine, through investigation using concrete materials, the surface area of a cylinder;	2	6:ME	17, 18
8m39	solve problems involving the surface area and the volume of cylinders, using a variety of strategies.	2	6:ME	14, 17, 18

Geometry and Spatial Sense

Overall Expectations

By the end of Grade 8, students will:

OCUP Code	Overall Expectation
8m40	demonstrate an understanding of the geometric properties of quadrilaterals and circles and the applications of geometric properties in the real world;
8m41	develop geometric relationships involving lines, triangles, and polyhedra, and solve problems involving lines and triangles;
8m42	represent transformations using the Cartesian coordinate plane, and make connections between transformations and the real world.

Geometric Properties

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m43	sort and classify quadrilaterals by geometric properties, including those based on diagonals, through investigation using a variety of tools;	2	3:G	28, 29, 32
8m44	construct a circle, given its centre and radius, or its centre and a point on the circle, or three points on the circle;	1	6:ME	5
8m45	investigate and describe applications of geometric properties in the real world.	1	6:ME	5

Geometric Relationships

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m46	determine, through investigation using a variety of tools, relationships among area, perimeter, corresponding side lengths, and corresponding angles of similar shapes;	2	3:G	34, 35
8m47	determine, through investigation using a variety of tools and strategies, the angle relationships for intersecting lines and for parallel lines and transversals, and the sum of the angles of a triangle;	2	3:G	18–29
8m48	solve angle-relationship problems involving triangles, intersecting lines, and parallel lines and transversals;	2	3:G	19–31, 36
8m49	determine the Pythagorean relationship, through investigation using a variety of tools and strategies;	1	5:G	3, 5
8m50	solve problems involving right triangles geometrically, using the Pythagorean relationship;	1	5:G	4, 6, 7
		1	6:ME	5, 8
8m51	determine, through investigation using concrete materials, the relationship between the numbers of faces, edges, and vertices of a polyhedron (i.e., number of faces + number of vertices = number of edges + 2).	2	7:G	37

Location and Movement

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m52	graph the image of a point, or set of points, on the Cartesian coordinate plane after applying a transformation to the original point(s) (i.e., translation; reflection in the x-axis, the y-axis, or the angle bisector of the axes that passes through the first and third quadrants; rotation of 90°, 180°, or 270° about the origin);	1	8:G	9–14
8m53	identify, through investigation, real-world movements that are translations, reflections, and rotations.	1	8:G	14

Patterning and Algebra

Overall Expectations

By the end of Grade 8, students will:

OCUP Code	Overall Expectation
8m54	represent linear growing patterns (where the terms are whole numbers) using graphs, algebraic expressions, and equations;
8m55	model linear relationships graphically and algebraically, and solve and verify algebraic equations, using a variety of strategies, including inspection, guess and check, and using a “balance” model.

Patterns and Relationships

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m56	represent, through investigation with concrete materials, the general term of a linear pattern, using one or more algebraic expressions;	2	4:PA	20–22, 24, <u>31</u> , 32
8m57	represent linear patterns graphically (i.e., make a table of values that shows the term number and the term, and plot the coordinates on a graph), using a variety of tools;	2	4:PA	25–30
8m58	determine a term, given its term number, in a linear pattern that is represented by a graph or an algebraic equation.	2	4:PA	20–22, 24, 28–30

Variables, Expressions, and Equations

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m59	describe different ways in which algebra can be used in real-life situations;	1	2:PA	5, 9
		2	4:PA	28–30
8m60	model linear relationships using tables of values, graphs, and equations, through investigation using a variety of tools;	2	4:PA	20, 23, 24, 26–30
8m61	translate statements describing mathematical relationships into algebraic expressions and equations;	1	2:PA	6, 11, 15
		2	4:PA	23
8m62	evaluate algebraic expressions with up to three terms, by substituting fractions, decimals, and integers for the variables;	1	2:PA	6
		2	4:PA	16–19
8m63	make connections between solving equations and determining the term number in a pattern, using the general term;	2	4:PA	21–24
8m64	solve and verify linear equations involving a one-variable term and having solutions that are integers, by using inspection, guess and check, and a “balance” model.	1	2:PA	7–9, 11, 15
		2	4:PA	17–19

Data Management and Probability

Overall Expectations

By the end of Grade 8, students will:

OCUP Code	Overall Expectation
8m65	collect and organize categorical, discrete, or continuous primary data and secondary data and display the data using charts and graphs, including frequency tables with intervals, histograms, and scatter plots;
8m66	apply a variety of data management tools and strategies to make convincing arguments about data;
8m67	use probability models to make predictions about real-life events.

Collection and Organization of Data

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m68	collect data by conducting a survey or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject, and record observations or measurements;	2	8:PDM	26–28
8m69	organize into intervals a set of data that is spread over a broad range;	1 2	4:PDM 2:PDM	1 12, 13
8m70	collect and organize categorical, discrete, or continuous primary data and secondary data, and display the data in charts, tables, and graphs (including histograms and scatter plots) that have appropriate titles, labels, and scales that suit the range and distribution of the data, using a variety of tools;	1 2	4:PDM 2:PDM	1, 2 10–14
8m71	select an appropriate type of graph to represent a set of data, graph the data using technology, and justify the choice of graph (i.e., from types of graphs already studied, including histograms and scatter plots);	1 2 2	4:PDM 2:PDM 8:PDM	3, 5 6, 9, 11, 12, 14 28
8m72	explain the relationship between a census, a representative sample, sample size, and a population.	2	8:PDM	26–28

Data Relationships

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m73	read, interpret, and draw conclusions from primary data and from secondary data, presented in charts, tables, and graphs (including frequency tables with intervals, histograms, and scatter plots);	1	4:PDM	1–4
		2	2:PDM	<u>6</u> , 7–9
8m74	determine, through investigation, the appropriate measure of central tendency (i.e., mean, median, or mode) needed to compare sets of data;	2	8:PDM	16, 17
8m75	demonstrate an understanding of the appropriate uses of bar graphs and histograms by comparing their characteristics;	2	2:PDM	12, 13
8m76	compare two attributes or characteristics, using a scatter plot, and determine whether or not the scatter plot suggests a relationship;	2	2:PDM	10
8m77	identify and describe trends, based on the rate of change of data from tables and graphs, using informal language;	1	4:PDM	4, 5
		2	2:PDM	12, 13
8m78	make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs;	1	4:PDM	1–3, 5
		2	2:PDM	7, 9
8m79	compare two attributes or characteristics, using a variety of data management tools and strategies (i.e., pose a relevant question, then design an experiment or survey, collect and analyse the data, and draw conclusions).	2	8:PDM	<u>27</u> , 28

Probability

By the end of Grade 8, students will:

ONTARIO CURRICULUM EXPECTATION		JUMP MATH WORKBOOK		
OCUP Code	Specific Expectation	Part	Unit	Lesson
8m80	compare, through investigation, the theoretical probability of an event (i.e., the ratio of the number of ways a favourable outcome can occur compared to the total number of possible outcomes) with experimental probability, and explain why they might differ;	2	8:PDM	24, 26
8m81	determine, through investigation, the tendency of experimental probability to approach theoretical probability as the number of trials in an experiment increases, using class-generated data and technology-based simulation models;	1	4:PDM	3
		2	8:PDM	24, 26
8m82	identify the complementary event for a given event, and calculate the theoretical probability that a given event will not occur.	2	8:PDM	25, 26