

Mental Math, Multiplicative Relationships and Equality

Overall Expectations

Students will:

- Solve problems involving the addition, subtraction, multiplication, and division of single- and multi-digit whole numbers, and involving the addition and subtraction of decimal numbers to tenths and money amounts, using a variety of strategies (4m10)
- Demonstrate an understanding of proportional reasoning by investigating whole-number unit rates (4m11)
- Demonstrate an understanding of equality between pairs of expressions, using addition, subtraction, and multiplication (4m75)

Specific Expectations

Students will:

- Add and subtract two-digit numbers, using a variety of mental strategies (4m25)
- Multiply to 9×9 and divide to $81 \div 9$, using a variety of mental strategies (4m29)
- Solve problems involving the multiplication of one-digit whole numbers, using a variety of mental strategies (4m30)
- Multiply whole numbers by 10, 100, and 1000, and divide whole numbers by 10 and 100, using mental strategies (4m31)
- Describe relationships that involve simple whole-number multiplication (4m35)
- Demonstrate an understanding of simple multiplicative relationships involving unit rates, through investigation using concrete materials and drawings (4m37)
- Determine, through investigation, the inverse relationship between multiplication and division (4m81)
- Determine the missing number in equations involving multiplication of one- and two-digit numbers, using a variety of tools and strategies (4m82)

Lesson	Learning Focus	Specific Expectations
Add Two-Digit Whole Numbers	<ul style="list-style-type: none"> • Add two-digit numbers using a variety of mental strategies <ul style="list-style-type: none"> o composing and decomposing numbers, friendly numbers, skip counting, adding up, compensation (give and take) etc 	4m25
Subtract Two-Digit Whole Numbers	<ul style="list-style-type: none"> • Subtract two-digit numbers using a variety of mental strategies <ul style="list-style-type: none"> o composing and decomposing numbers, friendly numbers, skip counting, adding up, compensation (give and take) etc. 	4m25
Multiply to 9×9	<ul style="list-style-type: none"> • Multiply to 9×9 using a variety of mental strategies <ul style="list-style-type: none"> o doubles, doubles plus one more set, skip counting, decomposing numbers etc. 	4m29
Divide to $81 \div 9$	<ul style="list-style-type: none"> • Investigate the inverse relationship between division and multiplication <ul style="list-style-type: none"> o divide to $81 \div 9$ using a variety of mental strategies 	4m29 4m81

Mental Math, Multiplicative Relationships and Equality (continued)

Lesson	Learning Focus	Specific Expectations
Missing Numbers	<ul style="list-style-type: none"> • Determine through investigation the missing number in equations involving multiplication and division 	4m29 4m81 4m82
Multiplicative Relationships	<ul style="list-style-type: none"> • Describe relationships that involve simple whole-number multiplication • Demonstrate an understanding of simple multiplicative relationships involving unit rates, through investigation using concrete materials and drawings 	4m35 4m37
Powers of Ten	<ul style="list-style-type: none"> • Multiply whole numbers by 10, 100, 1000 and divide whole numbers by 10 and 100 using a variety of mental strategies 	4m31
Solve Problems	<ul style="list-style-type: none"> • Solve problems involving <ul style="list-style-type: none"> ○ 1-digit multiplication and division problems ○ 2-digit addition and subtraction ○ powers of 10 ○ selection of appropriate operation with reasoning 	4m25 4m29 4m30 4m31 4m35 4m37
Consolidation and Summative Tasks		

Add Two-Digit Whole Numbers

Specific Expectations: 4m25

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 1 Activity 3: Operations Part 1: Addition & Subtraction with Whole Numbers OERB ID: ELO1471910	mathies <ul style="list-style-type: none"> • Colour Tiles • Money • Number Line • Rekenrek • Set Tool • Whole Number Rods • Catch a Bouncing Ball- Whole Number Operations
Minds On	<ul style="list-style-type: none"> • Add one digit numbers using a variety of mental strategies 		NCTM Illuminations <ul style="list-style-type: none"> • Odd Man Out: Identifying Sums of Numbers as Odd or Even • Deep Sea Duel • Chip Trading: Practicing Single-Digit Addition with Colored Chips Representing Ones, Tens, and Hundreds
Action	<ul style="list-style-type: none"> • Add two-digit numbers using a variety of mental strategies <ul style="list-style-type: none"> o composing and decomposing numbers, friendly numbers, skip counting, adding up, compensation (give and take) etc 		
Consolidation			

Subtract Two-Digit Whole Numbers

Specific Expectations: 4m25

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 1 Activity 3: Operations Part 1: Addition & Subtraction with Whole Numbers OERB ID: ELO1471910	mathies <ul style="list-style-type: none"> • Colour Tiles • Money • Number Line • Rekenrek • Set Tool • Whole Number Rods • Catch a Bouncing Ball- Whole Number Operations
Minds On	<ul style="list-style-type: none"> • Subtract one digit numbers using a variety of strategies 		
Action	<ul style="list-style-type: none"> • Subtract two-digit numbers using a variety of mental strategies <ul style="list-style-type: none"> o composing and decomposing numbers, friendly numbers, skip counting, adding up, compensation (give and take) etc. 		
Consolidation			

Multiply to 9 x 9

Specific Expectations: 4m29

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 1 Activity 8: Operations Part 4: The Basic Facts OERB ID: ELO1471910	Guide to Effective Instruction: Teaching Basic Facts and Multi-digit Computation Grades K – 6 Vol. 5 <ul style="list-style-type: none"> pp 69 – 72 Appendix 10-2: Instructions for Games and Activities
Minds On	<ul style="list-style-type: none"> Multiplication using mental math strategies to 7 x 7 	Unit 1 Activity 8 Part A: Minds On <ul style="list-style-type: none"> Under the Sea – equal groups, repeated addition, number sentences, arrays to 7 x 7 Multiplication Explorer – practice to 6 x 6 with array 	mathies <ul style="list-style-type: none"> Colour Tiles Money Number Line Rekenrek Set Tool Whole Number Rods Catch a Bouncing Ball- Whole Number Operations
Action	<ul style="list-style-type: none"> Multiply to 9 x 9 using a variety of mental strategies <ul style="list-style-type: none"> doubles, doubles plus one more set, skip counting, decomposing numbers etc. 	Unit 1 Activity 8: Action OERB ID: ELO1470510 <ul style="list-style-type: none"> Strategies for Multiplying by Nine – using x10 facts to find x9, patterns in the digits OERB ID: ELO1414560 Strategies For Multiplying by Eight – arrays, skip counting, distributive property (split array) OERB ID: ELO1414550 Toolbox – x7 with money, decomposing into x5 + x2 Anchor chart for strategies for multiplying Assignment 1: Math Trainer - drill 	NCTM Illuminations <ul style="list-style-type: none"> Balance Beam Discoveries Finding Products Concentration Looking for Calculator Patterns More Patterns with Products Keeping It All Together Factorize Times Square: Reinforcing Multiplication Skills Using Factors and Strategy Bunny Times
Consolidation		Unit 1 Activity 8: Consolidation <ul style="list-style-type: none"> Discussion – strategies for 8 x 7 	Gap Closing J/I Student Book: Multiplying and Dividing pp 8 – 11

Multiply to 9 x 9 (continued)

Specific Expectations: 4m29

	Learning Focus	Blended Learning	Other Resources
Consolidation			Gap Closing J/I Facilitator Guide: Multiplying and Dividing pp 8 – 9

Divide to $81 \div 9$

Specific Expectations: 4m29, 4m81

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 1 Activity 8: Operations Part 4: The Basic Facts OERB ID: ELO1471910	mathies <ul style="list-style-type: none"> • Colour Tiles • Money • Number Line • Rekenrek • Set Tool • Whole Number Rods • Catch a Bouncing Ball- Whole Number Operations
Minds On	<ul style="list-style-type: none"> • Make arrays representing multiplication (to 9×9) and division facts (to $81 \div 9$) 	Unit 1 Activity 8 Part B: Minds On OERB ID: ELO1470510 <ul style="list-style-type: none"> • Discussion – make division and multiplication facts from an array • Anchor chart – add relationship between multiplication and division 	
Action	<ul style="list-style-type: none"> • Investigate the inverse relationship between division and multiplication <ul style="list-style-type: none"> o divide to $81 \div 9$ using a variety of mental strategies 	Unit 1 Activity 8: Action <ul style="list-style-type: none"> • Division – Math is Fun <ul style="list-style-type: none"> o reading about division – splitting apart in equal groups, fair sharing, remainders <p><i>Note: No need to cover remainders here</i></p> <ul style="list-style-type: none"> • Assignment 2: Apple Baskets Division <ul style="list-style-type: none"> o practice with quotative division – no remainder • Assignment 3: Basic Fact Strategies 	Gap Closing J/I Student Book: Multiplying and Dividing pp 21 – 28 Gap Closing J/I Facilitator Guide: Multiplying and Dividing pp 20 – 22
Consolidation		Unit 1 Activity 8 Part B: Minds On <ul style="list-style-type: none"> • Discussion <ul style="list-style-type: none"> o how an array can be used to explain how multiplying and dividing are related 	

Missing Numbers

Specific Expectations: 4m29, 4m81, 4m82

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 4 Activity 3: The Commutative Property, Inverse Relationships and Equations OERB ID: ELO1471940	Guide to Effective Instruction: Patterning and Algebra Grades 4 – 6 <ul style="list-style-type: none"> pp 57 – 64 What’s My Rule?
Minds On	<ul style="list-style-type: none"> Review fact families 		mathies <ul style="list-style-type: none"> Catch a Bouncing Ball- Whole Number Operations
Action	<ul style="list-style-type: none"> Determine through investigation the missing number in equations involving multiplication and division 	Unit 4 Activity 3: Missing Numbers OERB ID: ELO1470720 <ul style="list-style-type: none"> Alien Algebra Part 3 – Find Missing Numbers OERB ID: ELO1418540 <ul style="list-style-type: none"> o solve for unknown numbers in equations Group Work Anchor Chart for solving equations Discussion – how did the properties help when solving equations Assignment 2 – Missing Numbers <ul style="list-style-type: none"> o $X \div$ equations with unknown in variety of places o word problems 	NCTM Illuminations <ul style="list-style-type: none"> Exploring Krypto Product Game
Consolidation		Unit 4 Activity 3: Consolidation <ul style="list-style-type: none"> Discussion – apply new strategies to $15 \times 7 \times 2$ 	

Multiplicative Relationships

Specific Expectations: 4m35, 4m37

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 4 Activity 3: The Commutative Property, Inverse Relationships and Equations OERB ID: ELO1471940	mathies <ul style="list-style-type: none"> • Colour Tiles • Money • Number Line • Rekenrek • Set Tool • Whole Number Rods • Catch a Bouncing Ball- Whole Number Operations
Minds On	<ul style="list-style-type: none"> • Review multiplication facts to 9 x 9 	Unit 4 Activity 3: Minds On OERB ID: ELO1470720 <ul style="list-style-type: none"> • Arrays – interactive tool • Discussion <ul style="list-style-type: none"> o describe the 5 sets of numbers and their arrays, make conclusions <p><i>Note: Good depth of numbers up to 9 x 9 but supplementation required for multiplying when decomposing a number into products (e.g. 7 x 24 could be 7 x 8 x 3 or 7 x 6 x 4 or 7 x 4 x 2 x 3 etc.)</i></p>	NCTM Illuminations <ul style="list-style-type: none"> • Egg Carton Designs: Constructing Arrays to Begin a Study of Multiplication
Action	<ul style="list-style-type: none"> • Describe relationships that involve simple whole-number multiplication • Demonstrate an understanding of simple multiplicative relationships involving unit rates, through investigation using concrete materials and drawings 	Unit 1 Activity 12: Action OERB ID: ELO1470550 <ul style="list-style-type: none"> • Discussion <ul style="list-style-type: none"> o pattern block investigation into multiplicative thinking • Assignment 1: Multiplicative Thinking Unit 4 Activity 3: Action <ul style="list-style-type: none"> • Alien Algebra OERB ID: ELO1418520 <ul style="list-style-type: none"> o investigate inverse relationships o understand inverse relationship between multiplication and division & addition and subtraction • Assignment 1 – Fact Families OERB ID: ELO1470720 <ul style="list-style-type: none"> o possible equations 	

Multiplicative Relationships (continued)

Specific Expectations: 4m35, 4m37

	Learning Focus	Blended Learning	Other Resources
Action		<ul style="list-style-type: none"> • Alien Algebra Part 2 OERB ID: ELO1470720 <ul style="list-style-type: none"> o multiplication and addition properties o commutative property 	
Consolidation		Unit 1 Activity 12: Consolidation <ul style="list-style-type: none"> • Discussion <ul style="list-style-type: none"> o skip counting, multiplicative thinking 	

Powers of Ten

Specific Expectations: 4m31

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 1 Activity 8: Operations Part 4: The Basic Facts OERB ID: ELO1471910	mathies <ul style="list-style-type: none"> • Colour Tiles • Money
Minds On	<ul style="list-style-type: none"> • Skip counting by tens and hundreds 	Unit 1 Activity 8 Part C: Minds On OERB ID: ELO1470510 <ul style="list-style-type: none"> • Discussion <ul style="list-style-type: none"> o the amount of money in stacks of dimes 	NCTM Illuminations <ul style="list-style-type: none"> • Number Line Dancing Gap Closing J/I Student Book: Representing and Renaming Whole Numbers pp 32 – 37
Action	<ul style="list-style-type: none"> • Multiply whole numbers by 10, 100, 1000 and divide whole numbers by 10 and 100 using a variety of mental strategies 	Unit 1 Activity 8 Part C: Action <ul style="list-style-type: none"> • Group Work <ul style="list-style-type: none"> o predict what happens when \times or \div by 10, 100, 1000 (only for \times) • Anchor chart for multiplying and dividing <i>Note: supplementation required for additional practice</i>	 Gap Closing J/I Facilitator Guide: Representing and Renaming Whole Numbers pp 22 – 25
Consolidation			

Solve Problems

Specific Expectations: 4m25, 4m29, 4m30, 4m31, 4m35, 4m37

	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> • Create arrays to 9 x 9 		NCTM Illuminations <ul style="list-style-type: none"> • Super Bowl Scores • Multiplication Stories • Picture Books and Patterns in Numbers
Action	<ul style="list-style-type: none"> • Solve problems involving <ul style="list-style-type: none"> ○ 1-digit multiplication and division problems ○ 2-digit addition and subtraction ○ powers of 10 ○ selection of appropriate operation with reasoning 		
Consolidation			

Consolidation & Summative Tasks

Specific Expectations: 4m25, 4m29, 4m30, 4m31, 4m35, 4m37, 4m81, 4m82

Blended Learning	Other Resources

Add Two-Digit Whole Numbers

Resource	URL
Teacher Guide: Unit 1 Activity 3: Operations Part 1: Addition & Subtraction with Whole Numbers	https://download.elearningontario.ca/repository/14/1471910000/Gr%204%20Math%20U1%20Teacher%20Notes/Combined%20Teacher%20Notes%20for%20Activities%201%20-%2012/content_3.html
mathies : Colour Tiles	http://mathies.ca/learningTools.php
mathies : Money	http://mathies.ca/learningTools.php#Mm0
mathies : Number Line	http://mathies.ca/learningTools.php#Nn0
mathies : Rekenrek	http://mathies.ca/learningTools.php#Rr0
mathies : Set Tool	http://mathies.ca/learningTools.php#Ss1
mathies : Whole Number Rods	http://mathies.ca/learningTools.php#Nn0
mathies : Catch a Bouncing Ball- Operations	http://mathies.ca/games.php#Cc0-2
NCTM Illuminations: Odd Man Out: Identifying Sums of Numbers as Odd or Even	http://illuminations.nctm.org/Lesson.aspx?id=3892
NCTM Illuminations: Deep Sea Duel	http://illuminations.nctm.org/DeepSeaDuelLP/
NCTM Illuminations: Chip Trading: Practicing Single-Digit Addition with Colored Chips Representing Ones, Tens, and Hundreds	http://illuminations.nctm.org/Lesson.aspx?id=3676

Subtract Two-Digit Whole Numbers

Resource	URL
Teacher Guide: Unit 1 Activity 3: Operations Part 1: Addition & Subtraction with Whole Numbers	https://download.elearningontario.ca/repository/14/1471910000/Gr%204%20Math%20U1%20Teacher%20Notes/Combined%20Teacher%20Notes%20for%20Activities%201%20-%2012/content_3.html
mathies : Colour Tiles	http://mathies.ca/learningTools.php
mathies : Money	http://mathies.ca/learningTools.php#Mm0
mathies : Number Line	http://mathies.ca/learningTools.php#Nn0
mathies : Rekenrek	http://mathies.ca/learningTools.php#Rr0
mathies : Set Tool	http://mathies.ca/learningTools.php#Ss1
mathies : Whole Number Rods	http://mathies.ca/learningTools.php#Nn0
mathies : Catch a Bouncing Ball- Operations	http://mathies.ca/games.php#Cc0-2

Multiply to 9 x 9

Resource	URL
Teacher Guide: Unit 1 Activity 8: Operations Part 4: The Basic Facts	http://oame.on.ca/eduproject/ontariomathedresources/files/Guide%20to%20Effective%20Instruction%20in%20Mathematics%20Vol%205%20K-6.pdf
Under the Sea	http://www.learnalberta.ca/content/me3usa/flash/index.html?goLesson=8
Multiplication Explorer	http://www.learnalberta.ca/content/me3us/flash/lessonLauncher.html?lesson=lessons/08/m3_08_00_x.swf
Unit 1 Activity 8: Action	https://download.elearningontario.ca/repository/14/1470510000/GR4MTH-EPU01A08/content_2.html
Strategies for Multiplying by Nine	https://download.elearningontario.ca/repository/14/1470510000/GR4MTH-EPU01A08/mme/Gr4_Math_Num_StrategiesforMultiplyingby9/1414560_Strategies%20for%20Multiplying%20By%209/Baturin_ArraysPt2StratsMultBy9.html
Strategies For Multiplying by Eight	https://download.elearningontario.ca/repository/14/1470510000/GR4MTH-EPU01A08/mme/Gr4_Math_Num_StrategiesforMultiplyingby8/1414550_Strategies%20for%20Multiplying%20by%208/Baturin_ArraysPt1StratsMultBy8.html
Math Trainer	http://www.mathsisfun.com/numbers/math-trainer-multiply.html
Unit 1 Activity 8: Consolidation	https://download.elearningontario.ca/repository/14/1470510000/GR4MTH-EPU01A08/content_3.html
Guide to Effective Instruction: Teaching Basic Facts and Multi-digit Computation Grades K – 6 Vol. 5	http://oame.on.ca/eduproject/ontariomathedresources/files/Guide%20to%20Effective%20Instruction%20in%20Mathematics%20Vol%205%20K-6.pdf
mathies: Colour Tiles	http://mathies.ca/learningTools.php
mathies: Money	http://mathies.ca/learningTools.php#Mm0
mathies: Number Line	http://mathies.ca/learningTools.php#Nn0
mathies: Rekenrek	http://mathies.ca/learningTools.php#Rr0
mathies: Set Tool	http://mathies.ca/learningTools.php#Ss1

Multiply to 9 x 9 (continued)

Resource	URL
mathies: Whole Number Rods	http://mathies.ca/learningTools.php#Nn0
mathies: Catch a Bouncing Ball- Operations	http://mathies.ca/games.php#Cc0-2
NCTM Illuminations: Balance Beam Discoveries	http://illuminations.nctm.org/Lesson.aspx?id=1261
NCTM Illuminations: Finding Products	http://illuminations.nctm.org/Lesson.aspx?id=1699
NCTM Illuminations: Concentration	http://illuminations.nctm.org/Activity.aspx?id=3563
NCTM Illuminations: Looking for Calculator Patterns	http://illuminations.nctm.org/Lesson.aspx?id=1271
NCTM Illuminations: More Patterns with Products	http://illuminations.nctm.org/Lesson.aspx?id=1274
NCTM Illuminations: Keeping It All Together	http://illuminations.nctm.org/Lesson.aspx?id=1276
NCTM Illuminations: Factorize	http://illuminations.nctm.org/Activity.aspx?id=3511
NCTM Illuminations: Times Square: Reinforcing Multiplication Skills Using Factors and Strategy	http://illuminations.nctm.org/Lesson.aspx?id=3697
NCTM Illuminations: Bunny Times	http://illuminations.nctm.org/Activity.aspx?id=6801
Gap Closing J/I Student Book: Multiplying and Dividing	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GapClosing/NumberSense_Junior-Int/GCU5_SB_MultiDividing.pdf
Gap Closing J/I Facilitator Guide: Multiplying and Dividing	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GapClosing/NumberSense_Junior-Int/GCU5_FG_MultiplyingDividing.pdf

Divide to $81 \div 9$

Resource	URL
Teacher Guide: Unit 1 Activity 8: Operations Part 4: The Basic Facts	https://download.elearningontario.ca/repository/14/1471910000/Gr%204%20Math%20U1%20Teacher%20Notes/Combined%20Teacher%20Notes%20for%20Activities%201%20-%2012/content_8.html
Unit 1 Activity 8 Part B: Minds On	https://download.elearningontario.ca/repository/14/1470510000/GR4MTH-EPU01A08/content_4.html
Math is Fun	http://www.mathsisfun.com/numbers/division.html
Apple Baskets Division	http://kidsnumbers.com/apple-baskets-division/
Assignment 3 Basic Fact Strategies	https://download.elearningontario.ca/repository/14/1470510000/GR4MTH-EPU01A08/assignment.html
mathies: Colour Tiles	http://mathies.ca/learningTools.php
mathies: Money	http://mathies.ca/learningTools.php#Mm0
mathies: Number Line	http://mathies.ca/learningTools.php#Nn0
mathies: Rekenrek	http://mathies.ca/learningTools.php#Rr0
mathies: Set Tool	http://mathies.ca/learningTools.php#Ss1
mathies: Whole Number Rods	http://mathies.ca/learningTools.php#Nn0
mathies: Catch a Bouncing Ball- Operations	http://mathies.ca/games.php#Cc0-2
Gap Closing J/I Student Book: Multiplying and Dividing	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GapClosing/NumberSense_Junior-Int/GCU5_SB_MultiDividing.pdf
Gap Closing J/I Facilitator Guide: Multiplying and Dividing	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GapClosing/NumberSense_Junior-Int/GCU5_FG_MultiplyingDividing.pdf

Missing Numbers

Resource	URL
Teacher Guide: Unit 4 Activity 3: The Commutative Property, Inverse Relationships and Equations	https://download.elearningontario.ca/repository/14/1471940000/Gr%204%20Math%20U4%20Teacher%20Notes/content_3.html
Alien Algebra Part 3 – Find Missing Numbers	https://download.elearningontario.ca/repository/14/1470720000/GR4MTH-EPU04A03/mme/Gr4_Math_PA_AlienAlgebraPart1/1418520_Alien%20Algebra%20Part%201/preloader.html
Unit 4 Activity 3: Missing Numbers	https://download.elearningontario.ca/repository/14/1470720000/GR4MTH-EPU04A03/content_4.html
Assignment 2 – Missing Numbers	https://download.elearningontario.ca/repository/14/1470720000/GR4MTH-EPU04A03/assignment.html
Unit 4 Activity 3: Consolidation	https://download.elearningontario.ca/repository/14/1470720000/GR4MTH-EPU04A03/content_5.html
Guide to Effective Instruction: Patterning and Algebra Grades 4 – 6	http://oame.on.ca/eduproject/ontariomathedresources/files/Patterning%20and%20Algebra%204-6.pdf
mathies: Catch a Bouncing Ball- Whole Number Operations	http://mathies.ca/games.php#Cc0-2
NCTM Illuminations: Exploring Krypto	http://illuminations.nctm.org/Lesson.aspx?id=2962
NCTM Illuminations: Product Game	http://illuminations.nctm.org/Activity.aspx?id=4213

Resource	URL
Teacher Guide: Unit 4 Activity 3: The Commutative Property, Inverse Relationships and Equations	https://download.elearningontario.ca/repository/14/1471940000/Gr%204%20Math%20U4%20Teacher%20Notes/content_3.html
Unit 4 Activity 3: Minds On	https://download.elearningontario.ca/repository/14/1470720000/GR4MTH-EPU04A03/content.html
Arrays – interactive tool	http://mathsframe.co.uk/en/resources/resource/62/itp_multiplication_array
Unit 1 Activity 12: Action	https://download.elearningontario.ca/repository/14/1470550000/GR4MTH-EPU01A12/content_2.html
Assignment 1: Multiplicative Thinking	https://download.elearningontario.ca/repository/14/1470550000/GR4MTH-EPU01A12/assignment.html
Alien Algebra	https://download.elearningontario.ca/repository/14/1470720000/GR4MTH-EPU04A03/mme/Gr4_Math_PA_AlienAlgebraPart1/1418520_Alien%20Algebra%20Part%201/preloader.html
Assignment 1 – Fact Families	https://download.elearningontario.ca/repository/14/1470720000/GR4MTH-EPU04A03/assignment.html
Alien Algebra Part 2	https://download.elearningontario.ca/repository/14/1470720000/GR4MTH-EPU04A03/mme/Gr4_Math_PA_AlienAlgebraP2/AlienAlgebraPart2_OBJECT/preloader.html
Unit 1 Activity 12: Consolidation	https://download.elearningontario.ca/repository/14/1470550000/GR4MTH-EPU01A12/content_3.html
mathies: Colour Tiles	http://mathies.ca/learningTools.php
mathies: Money	http://mathies.ca/learningTools.php#Mm0
mathies: Number Line	http://mathies.ca/learningTools.php#Nn0
mathies: Rekenrek	http://mathies.ca/learningTools.php#Rr0
mathies: Set Tool	http://mathies.ca/learningTools.php#Ss1
mathies: Whole Number Rods	http://mathies.ca/learningTools.php#Nn0
mathies: Catch a Bouncing Ball-Operations	http://mathies.ca/games.php#Cc0-2
NCTM Illuminations: Egg Carton Designs: Constructing Arrays to Begin a Study of Multiplication	http://illuminations.nctm.org/Lesson.aspx?id=3786

Resource	URL
Teacher Guide: Unit 1 Activity 8: Operations Part 4: The Basic Facts	https://download.elearningontario.ca/repository/14/1471910000/Gr%204%20Math%20U1%20Teacher%20Notes/Combined%20Teacher%20Notes%20for%20Activities%201%20-%2012/content_8.html
Unit 1 Activity 8 Part C: Minds On	https://download.elearningontario.ca/repository/14/1470510000/GR4MTH-EPU01A08/content_7.html
Unit 1 Activity 8 Part C: Action	https://download.elearningontario.ca/repository/14/1470510000/GR4MTH-EPU01A08/content_8.html
mathies: Colour Tiles	http://mathies.ca/learningTools.php
mathies: Money	http://mathies.ca/learningTools.php#Mm0
NCTM Illuminations: Number Line Dancing	http://illuminations.nctm.org/Lesson.aspx?id=3311
Gap Closing J/I Student Book: Representing and Renaming Whole Numbers	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GapClosing/NumberSense_Junior-Int/GCU3_SB_RepresentingandRenamingWholeNumbers.pdf
Gap Closing J/I Facilitator Guide: Representing and Renaming Whole Numbers	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GapClosing/NumberSense_Junior-Int/GCU3_FG_RepresentingandRenamingWholeNumbers.pdf

Solve Problems

Resource	URL
NCTM Illuminations: Super Bowl Scores	https://illuminations.nctm.org/lesson.aspx?id=872
NCTM Illuminations: Multiplication Stories	http://illuminations.nctm.org/Lesson.aspx?id=1703
NCTM Illuminations: Picture Books and Patterns in Numbers	http://illuminations.nctm.org/Lesson.aspx?id=6561