

Linear Growing Patterns

Overall Expectations

Students will:

- Represent linear growing patterns (where the terms are whole numbers) using concrete materials, graphs, and algebraic expressions (7m58)
- Model real-life linear relationships graphically and algebraically, and solve simple algebraic equations using a variety of strategies, including inspection and guess and check (7m59)

Specific Expectations

Students will:

- Represent linear growing patterns, using a variety of tools and strategies (7m60)
- Make predictions about linear growing patterns, through investigation with concrete materials (7m61)
- Develop and represent the general term of a linear growing pattern, using algebraic expressions involving one operation (7m62)
- Compare pattern rules that generate a pattern by adding or subtracting a constant, or multiplying or dividing by a constant, to get the next term with pattern rules that use the term number to describe the general term (7m63)
- Model real-life relationships involving constant rates where the initial condition starts at 0, through investigation using tables of values and graphs (7m64)
- Model real-life relationships involving constant rates, using algebraic equations with variables to represent the changing quantities in the relationship (7m65)
- Translate phrases describing simple mathematical relationships into algebraic expressions, using concrete materials (7m66)
- Evaluate algebraic expressions by substituting natural numbers for the variables (7m67)
- Make connections between evaluating algebraic expressions and determining the term in a pattern using the general term (7m68)
- Solve linear equations of the form $ax = c$ or $c = ax$ and $ax + b = c$ or variations such as $b + ax = c$ and $c = bx + a$ (where a , b , and c are natural numbers) by modelling with concrete materials, by inspection, or by guess and check, with and without the aid of a calculator (7m69)

Lesson	Learning Focus	Specific Expectations
Patterns	<ul style="list-style-type: none"> • Identify, represent, create, and make predictions about linear growing patterns using concrete materials and pattern rules • Compare pattern rules that generate a pattern by adding or subtracting a constant or multiplying or dividing by a constant to get the next term 	7m60 7m61 7m63
Identify & Represent Linear Growing Patterns Concretely	<ul style="list-style-type: none"> • Use concrete materials or pictorial representations to identify, represent, and create linear growing patterns 	7m60
Making Predictions	<ul style="list-style-type: none"> • Make predictions about linear growing patterns using concrete materials 	7m61

Linear Growing Patterns (continued)		
Lesson	Learning Focus	Specific Expectations
Linear Growing Patterns	<ul style="list-style-type: none"> • Create a table of values from concrete and pictorial representations of linear growing patterns • Create a graph from a table of values of linear growing patterns • Make predictions about future values in the table of values • Connect tables of values to graphs, recognizing all linear growing patterns make straight lines 	7m60 7m61
Linear Growing Patterns - Continued	<p>Increase the complexity of the pattern to:</p> <ul style="list-style-type: none"> • Create a table of values from concrete and pictorial representations of linear growing patterns • Create a graph from a table of values of linear growing patterns • Create a pattern rule from a table of values, graph and concrete or pictorial representation of linear growing patterns • Make predictions about future values in the table of values • Connect tables of values to graphs – recognizing all linear growing patterns make straight lines 	7m60 7m61
Algebraic Expressions from Concrete Representations	<ul style="list-style-type: none"> • Develop and represent the general term of a linear growing pattern using algebraic expressions involving one operation, given a concrete representation 	7m62 7m63 7m66
Algebraic Expressions from Pattern Rules	<ul style="list-style-type: none"> • Explore the creation of an algebraic expression with one operation given a pattern rule • Test pattern rules for reasonableness and accuracy 	7m62 7m63 7m66
General Term	<ul style="list-style-type: none"> • Create an algebraic expression to represent the general term with one operation from: <ul style="list-style-type: none"> ◦ graphs ◦ tables of values ◦ pattern rules ◦ concrete or pictorial representations • Test pattern rules for reasonableness and accuracy • Explore how finding a term value is connected to substitution into the algebraic pattern rule 	7m66 7m67 7m68

Linear Growing Patterns (continued)

Lesson	Learning Focus	Specific Expectations
Real-Life Linear Relationships	<ul style="list-style-type: none"> Connect real-life relationships to linear growing patterns Model real-life relationships with linear growing patterns (e.g., tables of values, algebraic equations, graphs) involving constant rates 	7m64 7m65
Linear Relationships Problems	<ul style="list-style-type: none"> Use graphs, table of values, and algebraic equations of linear relationships to solve real-life questions involving constant rates 	7m64, 7m65 7m67, 7m69
Translate into Algebraic Expressions	<ul style="list-style-type: none"> Translate math relationships into algebraic expressions Translate algebraic expressions into words 	7m66
Evaluate Algebraic Expressions	<ul style="list-style-type: none"> Use measurement formulas and other real-life contexts to evaluate expressions 	7m67
Solve Equations by Guess and Check and by Inspection	<ul style="list-style-type: none"> Solve and verify equations of the form $ax=c$ or $c = ax$ and $ax+ b = c$ or variations by modelling with concrete materials with and without the aid of a calculator 	7m69
Solve Linear Equations by Modelling	<ul style="list-style-type: none"> Solve equations of the form $ax = c$ or $c = ax$ and $ax+ b = c$ or variations by modelling with concrete materials, by inspection, or by guess and check with and without the aid of a calculator 	7m69
Consolidation and Summative Tasks		

Patterns

Specific Expectations: 7m60, 7m61, 7m63

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 4 Activity 3: Patterns OERB ID: ELO1471880	Continuum and Connections: Patterning and Algebraic Modelling
Minds On	<ul style="list-style-type: none"> Review pattern rules that add or subtract a constant 	Unit 4 Activity 3: Minds On OERB ID: ELO1471540 <ul style="list-style-type: none"> Discussion <ul style="list-style-type: none"> extend the pattern give pattern rule 	p 18 mathies <ul style="list-style-type: none"> Colour Tiles
Action	<ul style="list-style-type: none"> Identify, represent, create, and make predictions about linear growing patterns using concrete materials and pattern rules Compare pattern rules that generate a pattern by adding or subtracting a constant or multiplying or dividing by a constant to get the next term 		Gizmos <ul style="list-style-type: none"> Finding Patterns GeoGebra <ul style="list-style-type: none"> Visual Patterns
Consolidation			

Identify and Represent Linear Growing Patterns Concretely

Specific Expectations: 7m60

	Learning Focus	Blended Learning	Other Resources
		<p>Teacher Guide Unit 4 Activity 1: Representing Linear Growing Patterns OERB ID: ELO1471880</p>	<p>TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers</p> <ul style="list-style-type: none"> Day 1: Toothpick Patterns Day 2: Patterns with Tiles
Minds On	<ul style="list-style-type: none"> Review how to display a pattern rule as a table of values 	<p>Unit 4 Activity 1: Minds On OERB ID: ELO1471300</p> <ul style="list-style-type: none"> Discussion <ul style="list-style-type: none"> view 4 of 7 patterns describe what kind of pattern they are 	<p>Homework Help</p> <ul style="list-style-type: none"> Patterns - Find the next 3 terms Word Problems - Finding a Pattern <p>mathies</p>
Action	<ul style="list-style-type: none"> Use concrete materials or pictorial representations to identify, represent, and create linear growing patterns 	<p>Unit 4 Activity 1: Action</p> <ul style="list-style-type: none"> Group Work <ul style="list-style-type: none"> Toothpick Pattern extend pattern predict the 20th and 100th explain why this is called a linear growing pattern 	<ul style="list-style-type: none"> Exploring Different Representations (Linear Growing Patterns) Colour Tiles Cube Games (Linear Growing Patterns) Dominoes (Linear Growing Patterns) Representation Match (Linear Growing Patterns)
Consolidation		<p>Unit 4 Activity 1: Consolidation</p> <ul style="list-style-type: none"> Whole-Class discussion of toothpick pattern Assignment 1: Pattern Practice <ul style="list-style-type: none"> extend pattern, predict 20th term, find nth term, emphasize table of values 	<p>Gizmos</p> <ul style="list-style-type: none"> Finding Patterns <p>101 Questions</p> <ul style="list-style-type: none"> Pixel Pattern Cup Stacking Rectangular Patterns Spiral Patterns <p>GeoGebra</p> <ul style="list-style-type: none"> Visual Patterns

Making Predictions

Specific Expectations: 7m61

	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> • Extend patterns 		<p>TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers</p> <ul style="list-style-type: none"> • Day 1: Toothpick Patterns • Day 2: Patterns with Tiles • Day 3: Pattern Practice <p>Continuum and Connections: Patterning and Algebraic Modelling p 10</p> <p>mathies</p> <ul style="list-style-type: none"> • Exploring Different Representations (Linear Growing Patterns) <p>GeoGebra</p> <ul style="list-style-type: none"> • Visual Patterns
Action	<ul style="list-style-type: none"> • Make predictions about linear growing patterns using concrete materials 		
Consolidation			

Linear Growing Patterns

Specific Expectations: 7m60, 7m61

	Learning Focus	Blended Learning	Other Resources
		Teacher Guides <ul style="list-style-type: none"> Unit 4 Activity 2: Making Predictions about Linear Growing Patterns OERB ID: ELO1471880 Unit 4 Activity 3: Patterns 	TIPS4RM Grade 7 Unit 5: Solving Equations <ul style="list-style-type: none"> Day 2: Models of Linear Relationships Day 4: Modelling Linear Relationships TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers <ul style="list-style-type: none"> Day 4: Pattern Exchange Homework Help <ul style="list-style-type: none"> Patterns - Find the next 3 terms mathies <ul style="list-style-type: none"> Exploring Different Representations (Linear Growing Patterns) Linear Graphing Representation Match (Linear Growing Patterns) Robot Rule Game Gizmos <ul style="list-style-type: none"> Functions Machine1 (Functions and Tables) Finding Patterns GeoGebra <ul style="list-style-type: none"> Visual Patterns
Minds On	<ul style="list-style-type: none"> Create a pattern rule from a table of values, a graph, a concrete or pictorial representation of linear growing patterns 	Unit 4 Activity 2: Minds On OERB ID: ELO1471310 <ul style="list-style-type: none"> Linear Growing Patterns OERB ID: ELO1412100 <ul style="list-style-type: none"> journal notes extend patterns and make predictions 	
Action	<ul style="list-style-type: none"> Create a table of values from concrete and pictorial representations of linear growing patterns Create a graph from a table of values of linear growing patterns Make predictions about future values in the table of values Connect tables of values to graphs, recognizing all linear growing patterns make straight lines 	Unit 4 Activity 2: Action <ul style="list-style-type: none"> Robot Transformer <ul style="list-style-type: none"> encourages students to think across table of values rather than down Unit 4 Activity 3: Action <ul style="list-style-type: none"> Comparing Trend Lines <ul style="list-style-type: none"> the effect of changing the multiplier Unit 4 Activity 3: Consolidation <ul style="list-style-type: none"> Assignment 1: Check Your Understanding <ul style="list-style-type: none"> trend lines, steeper, flatter <i>Note: supplementation required to develop the idea of constant, term and term value as well as:</i> <ul style="list-style-type: none"> create a table of values from concrete and pictorial representations of linear growing patterns make predictions about future values in the table of values 	
Consolidation		<i>Note: See next Page</i>	

Linear Growing Patterns (continued)

Specific Expectations: 7m60, 7m61

	Learning Focus	Blended Learning	Other Resources
Consolidation		Unit 4 Activity 2: Consolidation <ul style="list-style-type: none"> • Assignment 1: Linear Robot Patterns <ul style="list-style-type: none"> o strategies used to predict the output when working with the Robot Transformer o describe the different ways to represent linear patterns 	CLIPS <ul style="list-style-type: none"> • Creating a Graphical Representation • Linear Growing Patterns - Check Your Understanding • Rocket Rules Desmos <ul style="list-style-type: none"> • Visual Patterns + Desmos = Amazing • Match My Pattern

Linear Growing Patterns – Continued

Specific Expectations: 7m60, 7m61

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 4 Activity 4: Investigating Real-Life Linear Relationships OERB ID: ELO1471880	TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers <ul style="list-style-type: none"> Day 4: Pattern Exchange
Minds On	<ul style="list-style-type: none"> Create a table of values based on a linear graph 	Unit 4 Activity 4: Action <ul style="list-style-type: none"> Patterns, Tables and Graphs, Oh My! OERB ID: ELO1412120 <ul style="list-style-type: none"> extend patterns with models, table of values and graphs explanation of steady rate of change and constant 	mathies <ul style="list-style-type: none"> Exploring Different Representations (Linear Growing Patterns) Linear Graphing Representation Match (Linear Growing Patterns) Robot Rule Game
Action	<ul style="list-style-type: none"> Increase the complexity of the pattern to: Create a table of values from concrete and pictorial representations of linear growing patterns Create a graph from a table of values of linear growing patterns Create a pattern rule from a table of values, graph and concrete or pictorial representation of linear growing patterns Make predictions about future values in the table of values Connect tables of values to graphs – recognizing all linear growing patterns make straight lines 		CLIPS <ul style="list-style-type: none"> Creating a Graphical Representation Linear Growing Patterns - Check Your Understanding Rocket Rules Desmos <ul style="list-style-type: none"> Visual Patterns + Desmos = Amazing Match My Pattern
Consolidation			

Algebraic Expressions from Concrete Representations

Specific Expectations: 7m62, 7m63, 7m66

	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> Reinforce the language and understanding of multiplier and constant 		Continuum and Connections: Patterning to Algebraic Modelling p 14
Action	<ul style="list-style-type: none"> Develop and represent the general term of a linear growing pattern using algebraic expressions involving one operation, given a concrete representation 		mathies <ul style="list-style-type: none"> Exploring Different Representations (Linear Growing Patterns)
Consolidation			

Algebraic Expressions from Pattern Rules

Specific Expectations: 7m62, 7m63, 7m66

	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> Identify the variables, constants and multipliers in algebraic expressions for other relationships 		TIPS4RM Grade 7: Unit 5: Solving Equations <ul style="list-style-type: none"> Day 1: Using Variables in Expressions
Action	<ul style="list-style-type: none"> Explore the creation of an algebraic expression with one operation given a pattern rule Test pattern rules for reasonableness and accuracy 		mathies <ul style="list-style-type: none"> Exploring Different Representations (Linear Growing Patterns)
Consolidation			

General Term			
Specific Expectations: 7m66, 7m67, 7m68			
	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> • Create a graph from a table of values 		TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers <ul style="list-style-type: none"> • Day 3: Pattern Practice • Day 4: Pattern Exchange
Action	<ul style="list-style-type: none"> • Create an algebraic expression to represent the general term with one operation from: <ul style="list-style-type: none"> o graphs o tables of values o pattern rules o concrete or pictorial representations • Test pattern rules for reasonableness and accuracy • Explore how finding a term value is connected to substitution into the algebraic pattern rule 		TIPS4RM Grade 7: Unit 5: Solving Equations <ul style="list-style-type: none"> • Day 1: Using Variables in Expressions <p>mathies</p> <ul style="list-style-type: none"> • Exploring Different Representations (Linear Growing Patterns) • Robot Rule Game
Consolidation			

Real-Life Linear Relationships

Specific Expectations: 7m64, 7m65

	Learning Focus	Blended Learning	Other Resources
		Teacher Guide Unit 4 Activity 4: Investigating Real-Life Linear Relationships OERB ID: ELO1471880	mathies <ul style="list-style-type: none"> • Linear Graphing • Exploring Different Representations (Linear Growing Patterns)
Minds On	<ul style="list-style-type: none"> • Find the nth term from a table of values 	Unit 4 Activity 4: Minds On OERB ID: ELO1471580 <ul style="list-style-type: none"> • Discussion: Stride Length Activity <ul style="list-style-type: none"> o measure stride o create table of values for 0-8 o graph o pattern rule 	
Action	<ul style="list-style-type: none"> • Connect real-life relationships to linear growing patterns • Model real-life relationships with linear growing patterns (e.g., tables of values, algebraic equations, graphs) involving constant rates 	Unit 4 Activity 4: Action <ul style="list-style-type: none"> • Assignment 1: Heartbeat and Breathing Rates <ul style="list-style-type: none"> o table of values, graph, expression 	
Consolidation		Unit 4 Activity 4: Consolidation <ul style="list-style-type: none"> • Discussion OERB ID: ELO1471580 <ul style="list-style-type: none"> o advantages and disadvantages of the table of values, the graph and the general term with regards to calculating heart rate or breathing rate 	

Linear Relationships Problems

Specific Expectations: 7m64, 7m65, 7m67, 7m69

	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> State the pattern rule from a given graph 		Continuum and Connections: Patterning and Algebraic Modelling p 24 mathies <ul style="list-style-type: none"> Linear Graphing Exploring Different Representations (Linear Growing Patterns)
Action	<ul style="list-style-type: none"> Use graphs, table of values, and algebraic equations of linear relationships to solve real-life questions involving constant rates 		
Consolidation			

Translate into Algebraic Expressions

Specific Expectations: 7m66

	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> Write a word problem to match an equation 		TIPS4RM Grade 7 Unit 5: Solving Equations <ul style="list-style-type: none"> Day 6: Translating Words into Simple Equations OERB <ul style="list-style-type: none"> Code Breakers Part 1 <ul style="list-style-type: none"> OERB ID: ELO1412430 Gap Closing I/S Student Book: Algebraic Expressions and Equations pp 6 – 10 Gap Closing I/S Facilitator's Guide: Algebraic Expressions and Equations pp 9 – 13
Action	<ul style="list-style-type: none"> Translate math relationships into algebraic expressions Translate algebraic expressions into words 		
Consolidation			

Evaluate Algebraic Expressions

Specific Expectations: 7m67

	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> • Substitute natural numbers for the variables to evaluate expressions 		TIPS4RM Grade 7 Unit 5: Solving Equations <ul style="list-style-type: none"> • Day 3: Evaluating Algebraic Expressions with Substitution Gap Closing I/S Student Book: Algebraic Expressions and Equations pp 16 – 19 Gap Closing I/S Facilitator's Guide: Algebraic Expressions and Equations pp 19 – 23 Gap Closing I/S Student Book: Solving Equations pp 21 – 25 Gap Closing I/S Facilitator's Guide: Solving Equations pp 26 – 30
Action	<ul style="list-style-type: none"> • Use measurement formulas and other real-life contexts to evaluate expressions 		
Consolidation			

Solve Equations by Guess and Check and by Inspection

Specific Expectations: 7m69

	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> Review what it means to “solve” an equation as well as strategies for solving equations (e.g., guess and check, inspection) 		TIPS4RM Grade 7 Unit 5: Solving Equations <ul style="list-style-type: none"> Day 5: Solving Equations Continuum and Connections: Solving Equations pp 11, 15, 19, 23, 27, 33
Action	<ul style="list-style-type: none"> Solve and verify equations of the form $ax=c$ or $c = ax$ and $ax+b = c$ or variations by modelling with concrete materials with and without the aid of a calculator 		Homework Help <ul style="list-style-type: none"> Solving One-Step Equations Geometer’s Sketchpad <ul style="list-style-type: none"> Solving Equations by Systematic Trial
Consolidation			GeoGebra <ul style="list-style-type: none"> Guess-and-Check Equation Solving Gap Closing I/S Student Book: Solving Equations pp 6 – 9
			Gap Closing I/S Facilitator’s Guide: Solving Equations pp 8 – 12

Solve Linear Equations by Modelling

Specific Expectations: 7m69

	Learning Focus	Blended Learning	Other Resources
Minds On	<ul style="list-style-type: none"> Review algebra tile representations 		Continuum and Connections: Solving Equations pp 11, 15, 19, 23, 27, 33
Action	<ul style="list-style-type: none"> Solve equations of the form $ax=c$ or $c = ax$ and $ax+b = c$ or variations by modelling with concrete materials, by inspection, or by guess and check with and without the aid of a calculator 		OERB <ul style="list-style-type: none"> Code Breakers Part 3 - Cybercrypto's Computer <ul style="list-style-type: none"> OERB ID: ELO1412450 Geometer's Sketchpad <ul style="list-style-type: none"> Equation Balance Dynamic Number <ul style="list-style-type: none"> Balance – Solving for Unknowns, Part 2
Consolidation			Gap Closing I/S Student Book: Solving Equations pp 10 – 15 Gap Closing I/S Facilitator's Guide: Solving Equations pp 13 – 19

Consolidation & Summative Tasks

Specific Expectations: 7m60, 7m61, 7m62, 7m63, 7m64, 7m65, 7m66, 7m67, 7m68, 7m69

Blended Learning	Other Resources

Resource	URL
Teacher Guide: Unit 4 Activity 3: Patterns	https://download.elearningontario.ca/repository/14/1471880000/Gr%207%20Math%20U4%20TG/Combined%20Teacher%20Notes%20Activities%201%20-%206/content_3.html
Unit 4 Activity 3: Minds On	https://download.elearningontario.ca/repository/14/1471540000/GRD7MTHEU04A03/content.html
Continuum and Connections: Patterning and Algebraic Modelling	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/ContiumAndConnections/PatterningAndAlgebraicModelling_Grades6-10.pdf
mathies : Colour Tiles	http://mathies.ca/learningTools.php
Gizmos: Finding Patterns	https://www.explorelearning.com/index.cfm?method=cResource.dspView&ResourceID=219
GeoGebra: Visual Patterns	https://www.geogebra.org/material/simple/id/91447#chapter/1099

Identify and Represent Linear Growing Patterns Concretely

Resource	URL
Teacher Guide: Unit 4 Activity 1: Representing Linear Growing Patterns	https://download.elearningontario.ca/repository/14/1471880000/Gr%207%20Math%20U4%20TG/Combined%20Teacher%20Notes%20Activities%201%20-%206/content.html
Unit 4 Activity 1: Minds On	https://download.elearningontario.ca/repository/14/1471300000/GRD7MTHEU04A01/content.html
Unit 4 Activity 1: Action	https://download.elearningontario.ca/repository/14/1471300000/GRD7MTHEU04A01/content_2.html
Unit 4 Activity 1: Consolidation	https://download.elearningontario.ca/repository/14/1471300000/GRD7MTHEU04A01/content_3.html
Assignment 1: Pattern Practice	https://download.elearningontario.ca/repository/14/1471300000/GRD7MTHEU04A01/assignment.html
TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers	http://www.edugains.ca/resources/LearningMaterials/TIPS/tips4rm/grade7/Unit2_PatternsIntegers.pdf
Homework Help: Patterns - Find the next 3 terms	https://homeworkhelp.ilc.org/chat/chat.php?config=playback&question_id=559300&type=bs
Homework Help: Word Problems - Finding a Pattern	https://homeworkhelp.ilc.org/tutorials/L_Objects/lo_objects_loader.php?object_id=485
mathies: Exploring Different Representations (Linear Growing Patterns)	http://mathies.ca/learningTools.php#Ee0
mathies: Colour Tiles	http://mathies.ca/learningTools.php#Ee0
mathies: Cube Games (Linear Growing Patterns)	http://oame.on.ca/CLIPS/lib/CL004_LinearGrowingPatterns/CL004_Games/CubeGames-LGP-RepMatch.pdf
mathies: Dominoes (Linear Growing Patterns)	http://www.oame.on.ca/CLIPS/lib/CL004_LinearGrowingPatterns/CL004_Games/Games_HexOminoes.pdf
mathies: Representation Match (Linear Growing Patterns)	http://oame.on.ca/CLIPS/swfPlayer.html?swfURL=lib/CL004_LinearGrowingPatterns/CL004_Games/CL004_MemoryMatchGame.swf
Gizmos: Finding Patterns	https://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=219

Identify and Represent Linear Growing Patterns Concretely (continued)

Resource	URL
101 Questions: Pixel Pattern	http://www.101qs.com/1579-pixel-pattern
101 Questions: Cup Stacking	http://www.101qs.com/2718-cup-stacking
101 Questions: Rectangular Patterns	http://www.101qs.com/2231-rectangular-patterns
101 Questions: Spiral Patterns	http://www.101qs.com/280-spiral-patterns
GeoGebra: Visual Patterns	https://www.geogebra.org/material/simple/id/91447#chapter/1099

Making Predictions

Resource	URL
TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers	http://www.edugains.ca/resources/LearningMaterials/TIPS/tips4rm/grade7/Unit2_PatternsIntegers.pdf
Continuum and Connections: Patterning and Algebraic Modelling	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/ContiumAndConnections/PatterningAndAlgebraicModelling_Grades6-10.pdf
mathies: Exploring Different Representations (Linear Growing Patterns)	http://mathies.ca/learningTools.php#Ee0
GeoGebra: Visual Patterns	https://www.geogebra.org/material/simple/id/91447#chapter/1099

Resource	URL
Teacher Guide: Unit 4 Activity 2: Making Predictions about Linear Growing Patterns	https://download.elearningontario.ca/repository/14/1471880000/Gr%207%20Math%20U4%20TG/Combined%20Teacher%20Notes%20Activities%201%20-%206/content_2.html
Teacher Guide: Unit 4 Activity 3: Patterns	https://download.elearningontario.ca/repository/14/1471880000/Gr%207%20Math%20U4%20TG/Combined%20Teacher%20Notes%20Activities%201%20-%206/content_3.html
Linear Growing Patterns	https://download.elearningontario.ca/repository/14/1471310000/GRD7MTHEU04A02/mme/Gr7_Math_PA_LinearGrowingPatterns/LO1140-HouseOfHorrorPart1/LO1140-HouseOfHorrorPart1.html
Robot Transformer	http://mathclips.ca/?cluster=4&clip=1&activity=1
Comparing Trend Lines	http://mathclips.ca/?cluster=4&clip=1&activity=3
Assignment 1: Check Your Understanding	http://mathclips.ca/?cluster=4&clip=1&activity=4
Assignment 1: Linear Robot Patterns	https://download.elearningontario.ca/repository/14/1471310000/GRD7MTHEU04A02/assignment.html
TIPS4RM Grade 7 Unit 5: Solving Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/Grade7English/Unit5_SolvingEquations.pdf
TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers	http://www.edugains.ca/resources/LearningMaterials/TIPS/tips4rm/grade7/Unit2_PatternsIntegers.pdf
Homework Help: Patterns - Find the next 3 terms	https://homeworkhelp.ilc.org/chat/chat.php?config=playback&question_id=559300&type=bs
mathies: Exploring Different Representations (Linear Growing Patterns)	http://mathies.ca/learningTools.php#Ee0
mathies: Linear Graphing Tool	http://mathies.ca/learningTools.php#LI0
Gizmos: Functions Machine1 (Functions and Tables)	https://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=1035
Gizmos: Finding Patterns	https://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=219
GeoGebra: Visual Patterns	https://www.geogebra.org/material/simple/id/91447#chapter/1099

Linear Growing Patterns (continued)

Resource	URL
CLIPS: Creating a Graphical Representation	http://oame.on.ca/CLIPS/index.html?cluster=4&clip=1&activity=2
CLIPS: Linear Growing Patterns - Check Your Understanding	http://oame.on.ca/CLIPS/index.html?cluster=4&clip=1&activity=4
CLIPS: Rocket Rules	http://oame.on.ca/CLIPS/index.html?cluster=4&clip=2&activity=1
Desmos: Visual Patterns + Desmos = Amazing	http://reasonandwonder.com/visual-patterns-desmos-amazing/
Desmos: Match My Pattern	https://teacher.desmos.com/activitybuilder/custom/55d0a1afe63779855e492364

Linear Growing Patterns - Continued

Resource	URL
Teacher Guide: Unit 4 Activity 4: Investigating Real-Life Linear Relationships	https://download.elearningontario.ca/repository/14/1471880000/Gr%207%20Math%20U4%20TG/Combined%20Teacher%20Notes%20Activities%201%20-%206/content_4.html
Patterns, Tables and Graphs, Oh My!	https://download.elearningontario.ca/repository/14/1471580000/GRD7MTHEU04A04/mme/Gr7_Math_PA_PatternsTablesGraphs/LO1142-HouseOfHorrorPart3/LO1142-HouseOfHorrorPart3.html
TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers	http://www.edugains.ca/resources/LearningMaterials/TIPS/tips4rm/grade7/Unit2_PatternsIntegers.pdf
mathies: Exploring Different Representations (Linear Growing Patterns)	http://mathies.ca/learningTools.php#Ee0
mathies: Linear Graphing Tool	http://mathies.ca/learningTools.php#LI0
mathies: Representation Match (Linear Growing Patterns)	http://www.mathclips.ca/swfPlayer.html?swfURL=lib/CL004_LinearGrowingPatterns/CL004_Games/CL004_MemoryMatchGame.swf
mathies: Robot Rule Game	http://www.mathclips.ca/lib/CL004_LinearGrowingPatterns/CL004_Games/RobotRuleGame.pdf
CLIPS: Creating a Graphical Representation	http://oame.on.ca/CLIPS/index.html?cluster=4&clip=1&activity=2
CLIPS: Linear Growing Patterns - Check Your Understanding	http://oame.on.ca/CLIPS/index.html?cluster=4&clip=1&activity=4
CLIPS: Rocket Rules	http://oame.on.ca/CLIPS/index.html?cluster=4&clip=2&activity=1
Desmos: Visual Patterns + Desmos = Amazing	http://reasonandwonder.com/visual-patterns-desmos-amazing/
Desmos: Match My Pattern	https://teacher.desmos.com/activitybuilder/custom/55d0a1afe63779855e492364

Algebraic Expressions from Concrete Representations

Resource	URL
Continuum and Connections: Patterning to Algebraic Modelling	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/ContiumAndConnections/PatterningAndAlgebraicModelling_Grades6-10.pdf
mathies : Exploring Different Representations (Linear Growing Patterns)	http://mathies.ca/learningTools.php#Ee0

Algebraic Expressions from Pattern Rules

Resource	URL
TIPS4RM Grade 7 Unit 5: Solving Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/Grade7English/Unit5_SolvingEquations.pdf
mathies : Exploring Different Representations (Linear Growing Patterns)	http://mathies.ca/learningTools.php#Ee0

General Term

Resource	URL
TIPS4RM Grade 7 Unit 2: Describing Patterns and on to Integers	http://www.edugains.ca/resources/LearningMaterials/TIPS/tips4rm/grade7/Unit2_PatternsIntegers.pdf
TIPS4RM Grade 7: Unit 5: Solving Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/Grade7English/Unit5_SolvingEquations.pdf
mathies : Exploring Different Representations (Linear Growing Patterns)	http://mathies.ca/learningTools.php#Ee0
mathies: Robot Rule Game	http://www.mathclips.ca/lib/CL004_LinearGrowingPatterns/CL004_Games/RobotRuleGame.pdf

Real-Life Linear Relationships

Teacher Guide: Unit 4 Activity 4: Investigating Real-Life Linear Relationships	https://download.elearningontario.ca/repository/14/1471880000/Gr%207%20Math%20U4%20TG/Combined%20Teacher%20Notes%20Activities%201%20-%206/content_4.html
Unit 4 Activity 4: Minds On	https://download.elearningontario.ca/repository/14/1471580000/GRD7MTHEU04A04/content.html
Assignment 1: Heartbeat and Breathing Rates	https://download.elearningontario.ca/repository/14/1471580000/GRD7MTHEU04A04/assignment.html
Unit 4 Activity 4: Consolidation	https://download.elearningontario.ca/repository/14/1471580000/GRD7MTHEU04A04/content_3.html
mathies: Linear Graphing	http://mathies.ca/learningTools.php#LI0
mathies: Exploring Different Representations (Linear Growing Patterns)	http://mathies.ca/learningTools.php#Ee0

Linear Relationships Problems

Resource	URL
Continuum and Connections: Patterning and Algebraic Modelling	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/ContiumAndConnections/PatterningAndAlgebraicModelling_Grades6-10.pdf
mathies: Linear Graphing	http://mathies.ca/learningTools.php#LI0
mathies: Exploring Different Representations (Linear Growing Patterns)	http://mathies.ca/learningTools.php#Ee0

Translate into Algebraic Expressions

TIPS4RM Grade 7 Unit 5: Solving Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/Grade7English/Unit5_SolvingEquations.pdf
OERB: Code Breakers Part 1	https://download.elearningontario.ca/repository/14/1412430000/LO1165.html
Gap Closing I/S Student Book: Algebraic Expressions and Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GapClosing/NumberSense_Int-Senior/6-AlgebraicExp_SB_IS.pdf
Gap Closing I/S Facilitator's Guide: Algebraic Expressions and Equations	http://www.edugains.ca/resources/LearningMaterials/GapClosing/Grade9/6-AlgebraicExp_FG_IS.pdf

Evaluate Algebraic Expressions

Resource	URL
TIPS4RM Grade 7 Unit 5: Solving Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/Grade7English/Unit5_SolvingEquations.pdf
Gap Closing I/S Student Book: Algebraic Expressions and Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GapClosing/NumberSense_Int-Senior/6-AlgebraicExp_SB_IS.pdf
Gap Closing I/S Facilitator's Guide: Algebraic Expressions and Equations	http://www.edugains.ca/resources/LearningMaterials/GapClosing/Grade9/6-AlgebraicExp_FG_IS.pdf
Gap Closing I/S Student Book: Solving Equations	http://www.edugains.ca/resources/LearningMaterials/GapClosing/Grade9/7-SolvingEquations_SB_IS.pdf
Gap Closing I/S Facilitator's Guide: Solving Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GapClosing/NumberSense_Int-Senior/7-SolvingEquations_FG_IS.pdf

Solve Equations by Guess and Check and by Inspection

Resource	URL
TIPS4RM Grade 7 Unit 5: Solving Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/Grade7English/Unit5_SolvingEquations.pdf
Continuum and Connections: Solving Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/ContiumAndConnections/SolvingEquations_Grades6-10.pdf
Homework Help: Solving One-Step Equations	https://homeworkhelp.ilc.org/tools/listen_learn/details.php?t_id=164
Geometer's Sketchpad: Solving Equations by Systematic Trial	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GSP/ExpressionsAndEquations/EquationsSystematicTrial.gsp
GeoGebra: Guess-and-Check Equation Solving	http://www.geogebra.org/m/1348777
Gap Closing I/S Student Book: Solving Equations	http://www.edugains.ca/resources/LearningMaterials/GapClosing/Grade9/7-SolvingEquations_SB_IS.pdf
Gap Closing I/S Facilitator's Guide: Solving Equations	http://www.edugains.ca/resources/LearningMaterials/GapClosing/Grade9/7-SolvingEquations_FG_IS.pdf

Solve Linear Equations by Modelling

Resource	URL
Continuum and Connections: Solving Equations	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/TIPS4RM/ContiumAndConnections/SolvingEquations_Grades6-10.pdf
OERB: Code Breakers Part 3 - Cybercrypto's Computer	https://download.elearningontario.ca/repository/14/1412450000/LO1167.html
Geometer's Sketchpad : Equation Balance	http://www.edugains.ca/resourcesMath/CE/LessonsSupports/GSP/ExpressionsAndEquations/EquationBalance.gsp
Dynamic Number: Balance – Solving for Unknowns, Part 2	http://www.dynamicnumber.org/balance__solving_for_unknowns_part_two
Gap Closing I/S Student Book: Solving Equations	http://www.edugains.ca/resources/LearningMaterials/GapClosing/Grade9/7-SolvingEquations_SB_IS.pdf
Gap Closing I/S Facilitator's Guide: Solving Equations	http://www.edugains.ca/resources/LearningMaterials/GapClosing/Grade9/7-SolvingEquations_FG_IS.pdf