

Curriculum Planning & Assessment Resource

Mathematics Grade 3



**Alberta Regional Professional
Development Consortia**

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Curriculum Planning & Assessment Resource

Mathematics

Grade 3 Patterns 1

About This Document

This Curriculum Planning & Assessment Resource is intended to be a collection of sample activities, assessments, and resources that teachers may wish to use as they develop their unit plans. This document is not intended to be a sequential list of activities. Rather, the intent is that teachers choose from this resource what is appropriate for their context, and sequence it in their planning.

The sample activities, assessments and resources included in this document have undergone an initial review to determine appropriateness and alignment to the curriculum. However, it is expected that teachers use their professional judgment in selecting activities, assessments and resources that are appropriate for their context.

While every attempt has been made to provide credit and receive permissions, some errors or omissions may have occurred. Please contact info@arpdc.ab.ca to report any error or omissions.

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Important Links	3	New Learn Alberta Progressions	Planners and Concept Maps
Introduction	3	<ul style="list-style-type: none"> • Competency Progressions • Numeracy Progressions • Literacy Progressions 	<ul style="list-style-type: none"> • K-3 Math Planners • 4-6 Math Planners (under development) • Assessment Planners (under development) • K-3 Math Action Verbs and 4-6 Math Verb Resources
KUSPs 3P1.1	4	Recorded Video: <ul style="list-style-type: none"> • How to Read these Curriculum Planning & Assessment Resources 	Curriculum Progressions <ul style="list-style-type: none"> • Skills and Procedures Progression K-3 (under development) • Concept Progressions (under development)
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Acknowledgements

Thank you to all the teachers, numeracy specialists, and technical expertise from Alberta school divisions and ARPDC who collaborated to develop, review, and revise these planning and assessment documents to support curriculum implementation.

Grade 3 - Patterns 1

Organizing Idea

Patterns: Awareness of patterns supports problem solving in various situations.

Guiding Question

How can diverse representations of patterns contribute to interpretation of change?

Outcome

3P1 Students analyze patterns in numerical sequences.

Summative Assessment(s) - Transfer *(In Progress)*

Summative assessments can include the following.

- *Understanding/making sense of a novel context from the real world using one or more concepts (eg. "How are place value and money related?").*
- *Understanding/making sense of a novel context using one or more understandings (eg. Students use money to model the conversion of base 10 values and relate them to base 10 block').*
- *Being able to describe why (linking concepts) something is true, a result, or what might be an extension using learned concepts and understandings.*
- *Apply learning (create products; undertake projects; taking action such as creating a campaign) in a novel context or taking action using the understanding(s).*
- *Construct arguments by taking a position and verifying/proving it with known understandings.*

Summative Assessment(s)

[3P1 Summative A with Outcomes](#)

[3P1 Summative Patterns, Patterns, Patterns](#)

[\[understanding surface vs deep vs transfer\]](#)

[3P1 Summative A \(French\)](#)



Click to jump!

[KUSP 3P1.1](#)

[KUSP 3P1.2](#)

[Literature Connections](#)

KUSP 3P1.1

Assumable Curriculum / Prerequisite Knowledge / Vocabulary

Practice skip-counting using number lines, hundred charts, etc., to build confidence with understanding that a finite pattern is usually a count-down pattern, whereas an infinite pattern is an increasing pattern that could go on indefinitely. Define and explain 'ordinal numbers.' Define and explain the terms "finite" and "infinite" sequences. Define and explain the terms "odd" and "even" numbers.

Student Language | Essential vocabulary & concepts

- **Ordinal number:** a number that shows order or numerical position: 2nd, 4th, 10th
- **Sequence:** a list of numbers or objects in an order
- **Finite:** having an end
- **Infinite:** having no end
- **Odd number:** a number that, when arranged in pairs, has one left over (remainder)
- **Even number:** a number that, when arranged in pairs, has no remainders

Pre-Assessments

Nelson Pre-Assessments 2: Finding Each Students Pathway

- Describing Increasing patterns - p.21
- Increasing Patterns - p. 22
- Decreasing Patterns - p. 23
- Creating Repeating Patterns - p.24
- Creating Increasing Patterns - p. 25
- Showing Increasing Patterns - p.26
- Creating and Translating Decreasing Patterns - p.27

Nelson Pre-Assessments 3: Finding Each Students Pathway

- Describing Increasing Patterns - p. 19
- Describing Decreasing Patterns - p. 20
- Extending Increasing Patterns - p.21
- Creating Increasing Patterns (100 chart included) - p. 22
- Extending Decreasing Patterns - p. 22
- Creating Decreasing Patterns (includes 100 chart) - p.24

Learning Recovery

-

I Know Statements | Metacognition

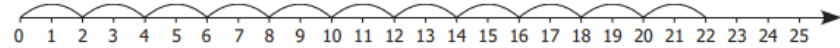
- I know ordinal numbers show position.
- I know finite sequences come to an end and infinite sequences never end.

I Can Statements | Skills

- I can explain what a sequence is.
- I can differentiate between a finite and an infinite sequence.
- I can find a pattern in a sequence of numbers.
- I can describe position in a sequence using an ordinal number.

Enhancement

- Find sequences in the environment.

Learning Outcome					
3P1.1 Students analyze patterns in numerical sequences.					
Knowledge	Understanding	Skills & Procedures	Achievement Indicators	Illustrative Examples	Assessments
<p>Ordinal numbers can indicate position in a sequence.</p> <p>Finite sequences, such as a countdown, have a definite end.</p> <p>Infinite sequences, such as the natural numbers, never end.</p>	<p>A sequence is a list of terms arranged in a certain order.</p> <p>Sequences may be finite or infinite.</p>	<p>Recognize familiar numerical sequences, including the sequence of even or odd numbers.</p>	<p>Recognize a given sequence as finite or infinite and as an extension continue a sequence using odd/even numbers.</p>	<p>Recognize and complete the following odd/even number sequences using hundreds chart, number lines, calendars, etc.</p> <p>Example A: Odd Number Sequences</p> <ol style="list-style-type: none"> 1, 11, 21... 63, 53, 43... 13, 11, 9... 23, 25, 27... <p>Example B: Even Number Sequences</p> <ol style="list-style-type: none"> 72, 82, 92... 6, 16, 26... 2, 4, 6... 28, 30, 32... <p>Number Sequences on a Number Line:</p> <p>Skip counting by 2s</p> 	<p>3P1.1a Make a Sequence - surface</p> <p>3P1.1 Complete a Sequence - surface</p> <p>3P1.1 Applying Rules - surface</p> <p>3P1.1 Working Backwards - deep</p>
		<p>Describe position in a sequence using ordinal numbers.</p>	<p>Describe a position in a sequence using an ordinal number.</p>	<p>Ordinal Numbers Word Problems</p> <p>Name: _____ Date: _____</p> <p>Read each question carefully. Then solve each problem.</p> <ol style="list-style-type: none"> The class lines up for a bus. Phillip is 14th in line. Jack is 15th in line. Cindy is behind Jack. In what place in line is Cindy? place Marcia is 30th in line. She counts how many children are in front of her. Have many children are in front of Marcia? children The class visits the cruise ship. James pushes the elevator button for the twentieth floor by mistake. They want to go one floor above. What floor do they want to go to? floor Chris, Albert, and Ramona are in line for a Talent Show. Chris is in line between Albert and Ramona. Albert's place is just in front of Chris's place. Ramona is 45th in line. What is Albert's place in line? place Mom is the third one in the line. Susan's little brother is next. Then Susan, then Amanda. What place is Amanda in the line? place 	<p>From: Live Worksheets</p> <p>Look at the number sequence. 135, 235, 335, 435, 535, 635 What is the third number in the sequence?</p>

				<p>1002, 1004, 1006, 1008, 1010, 1012 What is the fifth number in the sequence?</p> <p>Infusing Indigenous Knowledge into Curriculum Website: Infusing Indigenous Knowledge (grade 3 materials)</p> <p>Identify patterns in beading, sewing, quilt making</p> <ul style="list-style-type: none"> • Use nature's manipulatives, such as cones: • Collect spruce cones and make patterns on the ground • Examine and describe colours of leaves and leaf imprints – count the veins, shapes, etc. • Describe examples such as the following as finite and/or infinite sequences: <ul style="list-style-type: none"> • Seasons, moon cycles, stars • Animal behaviours • Flowers and leaves • Drop of water • Discuss concept of infinite in Treaties, with “until the rivers flow...” • Recognize stages of life - Rites of Passage • Describe families as infinite with the concept of generations. 	
		Differentiate between finite and infinite sequences.	Determine if a sequence is finite (countdown) or an infinite (counting up) sequence of the natural numbers.	<p>Identify if the following set of numbers are finite or infinite.</p> <ol style="list-style-type: none"> 1. 20, 15, 10, 5 2. 5, 6, 7, 8, 9 3. 100, 75, 50 4. 200, 201, 202 	3P1.1 Finite and Infinite Sequences - deep

Resources

Mathology

[ARPD Math Little Books for Alberta Curriculum](#)
[Mathology Free Resources on New Learn Alberta](#)

Mathology Little Books

Mathology Little Book: [Nimir's Marvellous Masterpieces](#)
Mathology Little Book: [How Numbers Work](#)

Links to Other Grades

Mathology Little Book: [The Best Surprise](#)

Mathology Interactive Tools

Math UP

Grade 3 Patterns

- o Lesson 1: Building Increasing Patterns
- o Lesson 2: Building Decreasing Patterns
- o Lesson 3: Relating a Number Pattern to a Rule or a Picture
- o Lesson 4: Comparing Patterns
- o Lesson 5: Multiplication Patterns

Number Talks:

- Select: Activities - Number Talks - Grade 3 - Patterns
- Number Talk 59

<ul style="list-style-type: none"> - Hundred Chart: circle odd and even numbers to create a sequence, or use the chart to skip-count. - Number Line: create a numerical sequence on the number line. 	
<p>Existing Textbooks</p> <p>Math Makes Sense Math Makes Sense 3 - Unit 1 Math Makes Sense 4 - Unit 1</p> <p>Math Focus Math Focus 4 - Chapter 1 Math Focus 4 - Chapter 1</p>	<p>NCETM (teacher guides and resources)</p> <p>TIMES TABLES: GROUPS OF 10 AND OF 5. AND FACTORS OF 0 AND 1 Spine 2: Multiplication and Division – Topic 2.4 See Teacher Guide and Slide Show; select relevant lessons.</p>
<p>Websites/Other</p> <p>(please share relevant sites)</p>	<p>Gizmos</p> <p>New Learn Alberta (Teacher Login Required) Pattern Flip Critter Count (Modeling Multiplication)</p> <p>For access to additional resources login to Gizmos account. Request an account alberta@explorellearning.com</p>
<p>Indigenous Lesson Plans and Resources</p> <p>Growing Chevron Pattern Fish, from Math First Peoples Teacher Resource Guide, p. 79-82 Cedar Mat Design, from Math First Peoples Teacher Resource Guide, p. 88-90</p> <ul style="list-style-type: none"> • Use patterns in beading. • Use nature’s manipulatives, such as cones: <ul style="list-style-type: none"> • Collect spruce cones and make patterns on the ground, • Examine and describe colours of leaves and leaf imprints - count the veins, shapes, etc. • Describe seasons as finite and infinite. • Discuss the concept of infinite in Treaties, with “until the rivers flow...” • Recognize stages of life - Rites of Passage • Describe families as infinite and the concept of generations • Use examples from sewing, and quilt making. <p>Source: KTCEA</p>	<p>Problem Solving</p> <p>Coming Soon</p> <p>Resources Developed by School Divisions/Educational Institutions</p> <p>Youcubed Tasks: Crackers</p> <p>Edmonton Catholic Pacing Guides</p> <p>Edmonton Catholic Curriculum Crates</p> <p>LearnAlberta Curriculum</p> <p>APRDC New Curriculum Professional learning Resources</p> <p>Alberta Teachers Association Library K-3 Mathematics & General Mathematics Resources</p> <p>Mathematics and Numeracy - New Curriculum Toolkit</p>



Click to jump!

[KUSP 3P1.1](#)

[KUSP 3P1.2](#)

[Literature Connections](#)

KUSP 3P1.2

Assumable Curriculum / Prerequisite Knowledge / Vocabulary

Student Language | Essential vocabulary & concepts

- **Skip-count:** to count forward or backward by a number other than 1
- **Pattern:** a repeated sequence or arrangement about which predictions can be made
- **Sequence:** a list of numbers or objects in a special order
- **Operation:** addition, subtraction, multiplication, and division are all operations
- **Addition:** an operation that puts two or more numbers together
- **Subtraction:** an operation where one number or amount is taken away from another
- **Multiplication:** an operation that combines equal groups; repeated addition; for example, 3×4 represents 3 groups of 4
- **Division:** an operation that involves equal sharing/grouping of a quantity; repeated subtraction; for example, $12 \div 4$ represents sharing 12 equally among 4 groups, or grouping 12 into groups of 4
- **Row:** an arrangement of numbers or objects from left to right
- **Column:** an arrangement of numbers or objects, one above the other
- **Term:** each part of a sequence

Pre-Assessments

Nelson Pre-Assessments 3: Finding Each Students Pathway

-

Nelson Leaps and Bounds pages will be referenced in the Assessments to follow up for emerging learners.

Learning Recovery

- Investigate number patterns, identify missing numbers, and explore increasing and decreasing patterns at an introductory level

I Know Statements | Metacognition

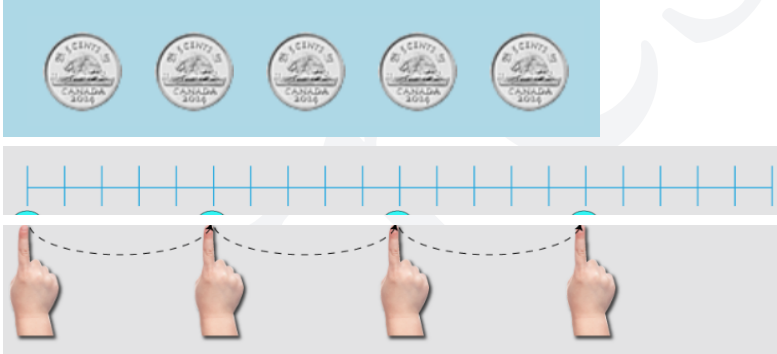
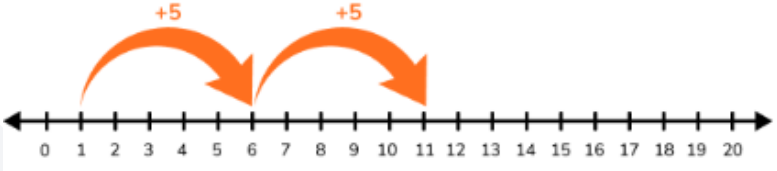
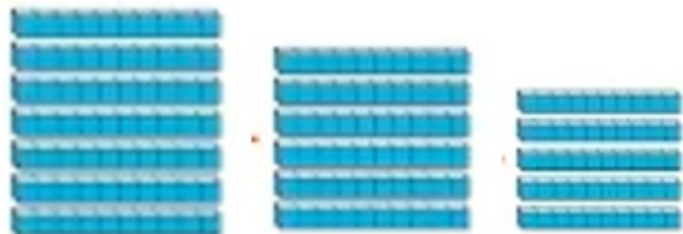
- I know how to use operations to make a number sequence.

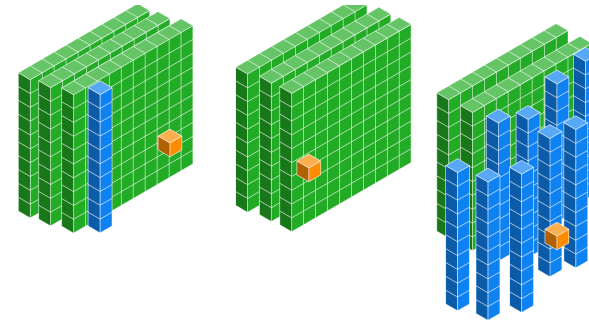
I Can Statements | Skills

- I can recognize skip-counting sequences using rows or columns in a multiplication chart.
- I can identify missing numbers in a skip-counting sequence using multiplication.
- I can describe change in a pattern using mathematical operations.

Enhancement

- Explain how patterns are alike/different.
- Identify patterns in the environment.

Learning Outcome			3P1 Students analyze patterns in numerical sequences.		
Knowledge	Understanding	Skills & Procedures	Achievement Indicators	Illustrated Examples	Assessments
Numerical sequences can be constructed using addition, subtraction, multiplication, or division.	A sequence can progress according to a pattern.	Recognize skip-counting sequences in various representations, including rows or columns of a multiplication table.	Recognize an increasing/ decreasing pattern in different ways.	<p>Identify a skip-counting sequence from various representations (e.g. coins, dollars, number lines, base ten, multiplication chart)</p> <p>Example A:</p>  <p>Solution: 5, 10, 15, 20, 25 which is skip counting by 5s (media4math)</p> <p>Example B:</p>  <p>What are the next three numbers in this sequence? (third space learning)</p> <p>Example C:</p>  <p>Solution: 70, 60, 50 which is skip-counting by 10</p> <p>Example D:</p>	3P1.2 The Patterns in Sequences - surface



Solution: 311, 301, 291 which is skip-counting by 10

Example E:

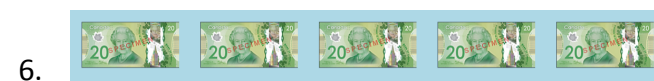
	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Solution: Skip counting by 7s using rows or columns

Identify the pattern rule within the sequence.

Identify the pattern rule:

- 1200, 1300, 1400
- 4000, 8000, 12,000
- 55,000, 110, 000, 165,000



Create a number pattern with the following rule:

- Increasing by 5
- Decreasing by 25
- Increasing by 100
- Decreasing by 50

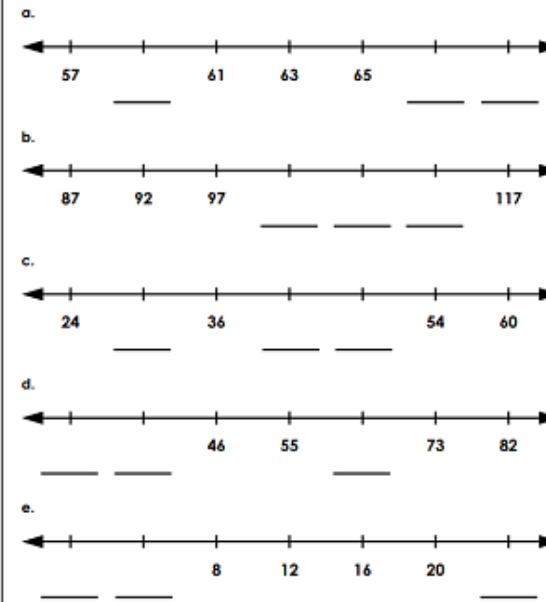
Determine any missing term in a skip-counting sequence using multiplication.

Extend an increasing/decreasing pattern.

Name: _____

Number Line Patterns

Write the missing numbers for each number line pattern.



3P1.2 Determining Missing Terms in Patterns - surface/deep

Identify missing terms in a skip-counting sequence using multiplication.

Complete skip-counting sequences like Example A first, then Example B using ordinal numbers.

Example A:

2, 4, 6, 8, __, 12,...

Write the multiplication statement to identify the missing term.

Solution: 5×2

Example B:

2, 4, 6, ... what is the fifth number in the sequence?

Write the multiplication statement that identifies the missing term.

Solution: 5×2

Example C:

What is the fifth number in a skip-counting sequence of 8?

Solution: 40 by multiplying 5×8

Describe the change from term to term in a numerical sequence using mathematical operations.

Describe the change from term to term in a numerical sequence using mathematical operations (addition, subtraction, multiplication and/or division).

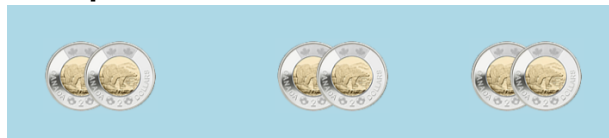
Describe the change in the number sequence or illustration.

Example A:

8, 16, 24, 32

Add 8 or Multiply by 2

Example B:



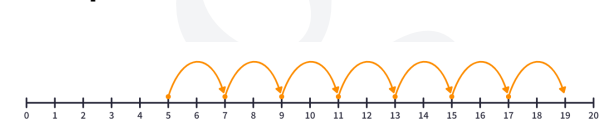
Add 2 or Multiply by 2

Example C:



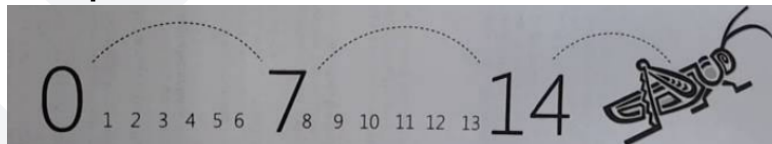
Subtract 10

Example D:



Add 2

Example E:



0, 7, 14, 21, 28

Multiply by 7 or Add 7

Example F:

16, 8, 4, 2

Divide by 2

[3P1.2 Which Operation is it? - deep](#)

Resources

Mathology

[ARPDG Math Little Books for Alberta Curriculum](#)
[Mathology Free Resources on New Learn Alberta](#)

Mathology Little Books

Mathology Little Book: [Namir's Marvellous Masterpieces](#)

Links to Other Grades

Mathology Little Book: [The Best Surprise](#)

Mathology Activities

Mathology Grade 3: Patterning Unit 1, Increasing and Decreasing Patterns: Activities 1-6

Mathology Grade 3: Patterning Unit 1 (Ontario), Patterns in Expressions: Activity 7

Mathology Interactive Tools

- [Hundred Chart](#): visualize patterns and identify the pattern for a sequence (how the terms change).
- [Number Line](#)
- [Pattern Blocks](#)

Math UP

Patterns

- o Lesson 1: Building Increasing Patterns
- o Lesson 2: Building Decreasing Patterns
- o Lesson 3: Relating a Number Pattern to a Rule or a Picture
- o Lesson 4: Comparing Patterns
- o Lesson 5: Multiplication Patterns

Math Makes Sense

Math Makes Sense 3 - Unit 1

Math Makes Sense 4 - Unit 1

Math Focus

Math Focus 4 - Chapter 1

Math Focus 4 - Chapter 1

NCETM (teacher guides and resources)

[TIMES TABLES: GROUPS OF 10 AND OF 5, AND FACTORS OF 0 AND 1](#)

Spine 2: Multiplication and Division – Topic 2.4

See Teacher Guide and Slide Show; select relevant lessons.

Websites/Other

(please share relevant sites)

Gizmos New Learn Alberta (Teacher Login Required)

[Pattern Flip](#)

[Critter Count \(Modeling Multiplication\)](#)

For access to additional resources login to Gizmos account. Request an account

alberta@explorelarning.com

Indigenous Lesson Plans and Resources

[Growing Chevron Pattern Fish](#), from Math First Peoples Teacher Resource Guide, p. 79-82

[Cedar Mat Design](#), from Math First Peoples Teacher Resource Guide, p. 88-90

Problem Solving

Coming Soon



Click to jump!

[KUSP 3P1.1](#)

[KUSP 3P1.2](#)

[Literature Connections](#)

Literature Connections

Title	Author	Format (Picture Book, Novel, Non-fiction, other)	Publisher	ISBN	Notes
Pitter Patter	Joyce Hesselberth	Picture Book	Greenwillow Books; Illustrated edition (Feb. 11 2020)	978-0062741233, 0062741233	Introducing kids to simple patterns that can be found everywhere around us
Pattern Fish	Trudy Harris	Picture Book	LERNER PUBLISHING GROUP; Illustrated edition (July 29 2009)	0761317120, 978-0761317128	Patterns
Pattern Bugs	Trudy Harris	Picture Book	LERNER PUBLISHING GROUP; Illustrated edition (Jan. 1 2001)	0761321071, 978-0761321071	Patterns
M&M's Color Pattern Book	Barbara Barbieri McGrath	Picture Book	CHARLESBRIDGE PUBLISHING (May 1 2002)	1570914176, 978-0439488433	Text describes how to sort M & M's to make various sequences to be constructed using addition, subtraction, multiplication, or division. Skip-counting sequences in various representations, including rows or columns.
Even Steven and Odd Todd	Kathryn Cristaldi	Picture Book	Cartwheel Books; Illustrated edition (April 1 1996)	0590227157, 978-0590227155	Even Steven and Odd Todd by Kathryn Cristaldi. Even Steven loved all things even. He liked to make everything in his life even. His Cousin Odd Todd was the opposite. Odd Todd likes all things odd. See what happens when Odd Todd comes to visit Even Steven for the summer.
I See A Pattern Here	Bruce Goldstone	Picture Book	Henry Holt and Co. (BYR); First Edition (March 10 2015)	0805092099, 978-0805092097	Real world examples of patterns Translations, tessalations, symmetry, (flips, rotations, slides) Acknowledge of Cultural Diversity
512 Ants on Sullivan Street	Carol A. Losi	Picture Book	Scholastic Us (Aug. 1 1997)	0590308769, 978-0590308762	Number pattern with doubling
Where's Harley?	Carol Felton	Picture Book (Epic)	Kane Press (July 13 2021)	978-1575651323	Concept of ordinal numbers
Albert the Muffin-Maker	Eleanor May	Picture Book (Epic)	Kane Press; Illustrated edition (Jan. 1 2014)	1575656329, 978-1575656328	Concept of ordinal numbers
Henry the Fourth	Stuart J. Murphy	Picture Book	HarperCollins; Illustrated edition (Jan. 1 1999)	9780064467193, 978-0064467193	Concept of ordinal numbers