

Curriculum Planning & Assessment Resource

Mathematics Grade 3



**Alberta Regional Professional
Development Consortia**

*Dedicated to the provision of professional learning
opportunities at the local, regional and provincial levels*



Curriculum Planning & Assessment Resource

Mathematics

Grade 3 - Number 4

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.

Table of Contents		Important Links	
Important Links	2	New Learn Alberta Progressions	Planners and Concept Maps
Introduction	2	<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
KUSP 3N4	4	Recorded Video:	Curriculum Progressions
Literature Connections	14	<ul style="list-style-type: none"> • How to Read these Curriculum Planning & Assessment Resources 	<ul style="list-style-type: none"> • Skills and Procedures Progression K-3 (under development) • Concept Progressions (under development)
			Interactive Numbered Outcomes Document with Skills

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 - Number 4

Organizing Idea

Number: Quantity is measured with numbers that enable counting, labeling, comparing, and operating

Guiding Question

How can fractions contribute to a sense of number?

Learning Outcome

3N4 Students interpret fractions in relation to one whole.

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.*

Transfer/Summative Samples [\[understanding surface vs deep vs transfer\]](#)

[Understanding Unit Fractions](#)

[Cupcake Window Shopping](#)



KUSPs 3N4

[Literacy Connections](#)

KUSP 3N4

Assumable Curriculum / Prerequisite Knowledge / Vocabulary

Equal shares; Understanding of unit fractions to tenths.

Student Language | Essential vocabulary & concepts

- **Fraction:** a number that tells us about part of a whole (e.g., one-third); a number that names a quantity between whole numbers
- **Whole:** the entire shape, area, or set of items that is being used to name fractions
- **Part:** a piece of the whole shape/area or a smaller collection within the whole set
- **Unit Fraction:** A fraction where the top number (the "numerator") is 1
- **Denominator:** represents the number of equal parts that make up the whole unit
- **Numerator:** represents the part out of the whole unit
- **Benchmark:** a known quantity used to estimate or compare

Pre-Assessments

Nelson Pre-Assessments 3: Finding Each Students Pathway

- Adding Mentally - p. 9
- Estimating Addition - p.10
- Adding to 1000 - p.11
- Subtraction Facts - p.12
- Subtracting Mentally - p.13
- Estimating for Subtracting - p.14
- Subtracting to 1000 - p.15

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

Learning Recovery

- Introduce that a fraction can be represented both as a part of a whole and as a part of a set

I Know Statements | Metacognition

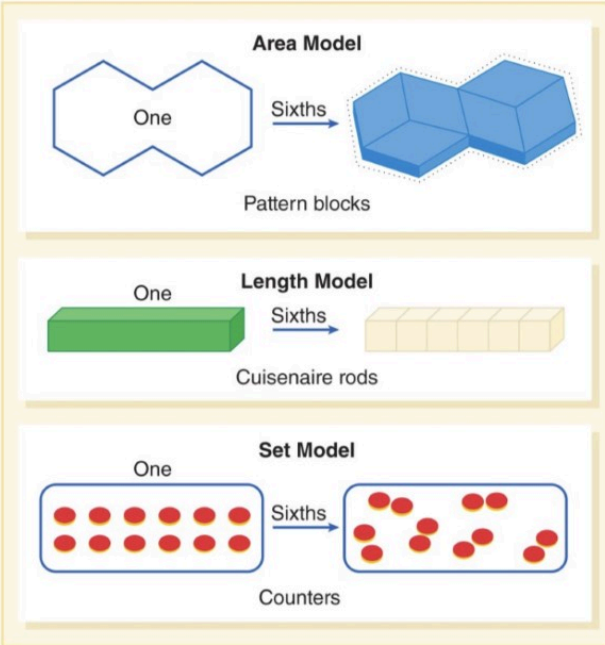








- I know fractions are numbers between counting numbers and they can be shown on a number line.
- I know a fraction can represent a part-whole situation.
- I know the numerator of a fraction tells the number of equal parts counted and the denominator tells the number of equal parts in the whole.
- I know that a fraction can represent part of one whole length, shape or object.
- I know that a fraction can represent equal parts of one whole.
- I know that a fraction can represent equal parts of a group.






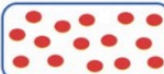

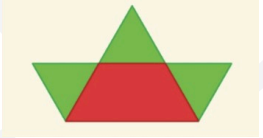

I Can Statements | Skills

- I can partition a whole into 12 or fewer equal parts.
- I can model fractions of a whole with denominators of 12 or less.
- I can compare the same fraction of different sized wholes.
- I can compare fractions that have different denominators.
- I can compare fractions that have the same numerator but different denominators.
- I can express fractions symbolically (i.e., $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$).
- I can show the position of a fraction (with a denominator of 12 or less) on a number line.
- I can express the relationship between two different fractions using the symbols $<$, $>$ or $=$.
- I can compare fractions to benchmarks of 0, $\frac{1}{2}$, and 1.

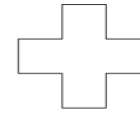
Enhancement

- Use a variety of reasoning strategies to determine how and why fractions (pictorially) are presented

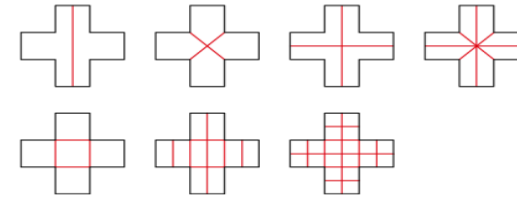
Learning Outcome	3N4 Students interpret fractions in relation to one whole.				
Knowledge	Understanding	Skills & Procedures	Achievement Indicators	Illustrative Examples	Assessments (Explainer)
<p>The same fraction can represent equal parts of one whole length, shape, or object equal groups of one whole quantity equal parts of each equal group in one whole quantity</p> <p>The name of a fraction describes its composition as a number of unit fractions.</p> <p>Fraction notation, (a/b), relates the numerator, a, a number of equal parts, to the denominator, b, the total number of equal parts in the whole.</p> <p>Equal numerators or equal denominators can facilitate the comparison of fractions.</p> <p>A fraction with a numerator that is equal to its denominator is one whole.</p> <p>Each fraction is associated with a point on the number line.</p>	<p>Fractions are numbers between natural numbers.</p> <p>Fractions can represent part-to-whole relationships.</p> <p>A unit fraction describes the size of the equal parts of a fraction.</p> <p>The size of the parts and the total number of equal parts in the whole are inversely related.</p>	<p>Model fractions of a whole quantity, length, shape, or object, in various ways, limited to denominators of 12 or less.</p> <p>Note: Unit Fractions should be considered as the lead work. Students should understand what a unit fraction is and how to count on a number line by the unit before using fraction terminology and identifying larger than one unit of a whole.</p>	<p>Model a given fraction of a whole using manipulatives (i.e., Cuisenaire Rods, pattern blocks, counters, fraction circles, etc.)</p>	<p>Representing sixths using a shape(area model), length (length model) or object (set model).</p>  <p>IF  = 1 WHOLE, THEN...</p> <p> = $\frac{1}{2}$  = $\frac{1}{3}$  = $\frac{1}{6}$</p> <p>  </p> <p>From Mix and Math</p> <p>Given the whole area, length, or set, model the given fraction using manipulatives.</p>	<p>Provide students with a variety of pattern blocks and ask them to identify the Unit fraction (shape that would create a unit fraction) for the given block.</p> <p>Use cuisenaire rods and challenge students to show all possible unit fractions for each rod.</p> <p>Place pennies, dimes, nickels, quarters and 50 cent pieces on a number line and have students determine the unit fraction represented. See sample below:</p>  <p>Model Fractions - surface/deep</p>

				<div data-bbox="1538 171 2107 836" style="border: 1px solid black; padding: 5px;"> <p> If this rectangle is one whole, —find <u>one-fourth</u>. —find <u>two-thirds</u>. —find <u>five-thirds</u>.</p> <p> If brown is the whole, find <u>one-fourth</u>.</p> <p> If dark green is one whole, what rod is <u>two-thirds</u>?</p> <p> If dark green is one whole, what rod is <u>three-halves</u>?</p> <p> If 8 counters are a whole set, how many are in <u>one-fourth</u> of a set?</p> <p> If 15 counters are a whole, how many counters make <u>three-fifths</u>?</p> <p> If 9 counters are a whole, how many are in <u>five-thirds</u> of a set?</p> </div> <p data-bbox="1538 897 2107 967">If the image below is one whole, model $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{1}{6}$, etc.</p> <div data-bbox="1693 977 1942 1108" style="text-align: center;">  </div>	
		<p data-bbox="761 1179 1050 1280">Visualize fractions as compositions of a unit fraction.</p>	<p data-bbox="1081 1179 1485 1290">Partition a whole into equal parts, demonstrating that the parts are equal.</p>	<p data-bbox="1516 1179 2107 1249">Given \$1 partitioned into 10 equal parts (relate to dimes)</p> <div data-bbox="1522 1260 2128 1380" style="text-align: center;">  </div> <p data-bbox="1516 1501 2107 1602">Partition a shape into equal parts. Determine the unit fractions (e.g. $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{5}$, $\frac{1}{10}$, etc.)</p>	<p data-bbox="2138 1179 2604 1209">Counting by Unit Fractions - Deep</p> <p data-bbox="2138 1239 2884 1270">Counting by Unit Fractions on a Number line - surface</p> <p data-bbox="2138 1300 2573 1330">What's the Unit Fraction - Deep</p>

- 'Find how you can divide this shape into:'
 - 'two equal parts'
 - 'four equal parts'
 - 'five equal parts'
 - 'eight equal parts.'
- 'You might find more than one way for each.'
- 'What other number of equal parts can you divide it into?'



Possible answers

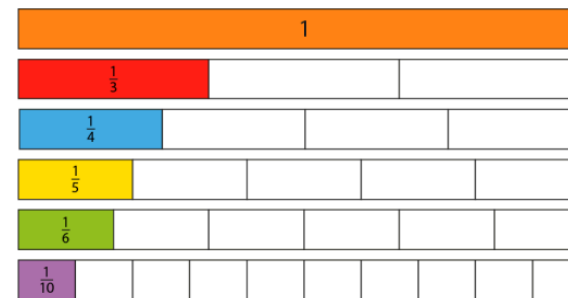


[From NCETM page 5](#)

Visualize fractions as compositions of a unit fraction.

Compositions of unit fractions

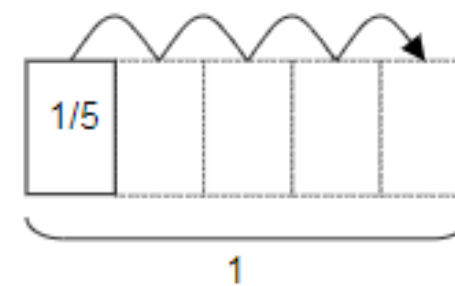
- 'What fraction is each piece of the whole length?'



Ordering the fractions:



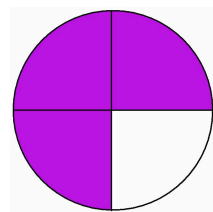
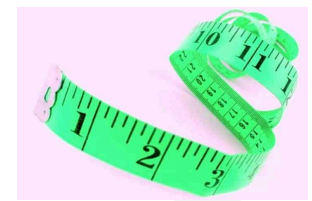
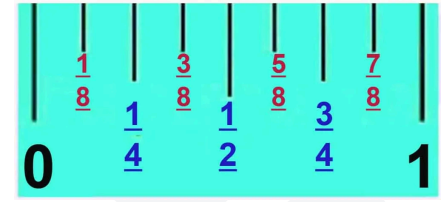



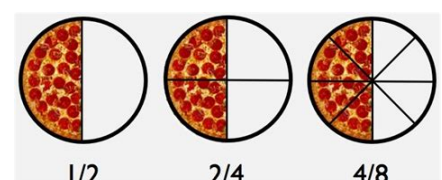
[From NCETM page 25](#)

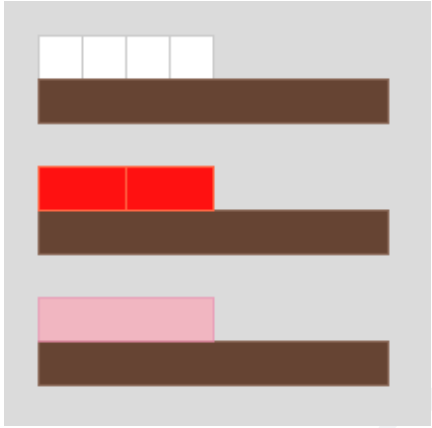

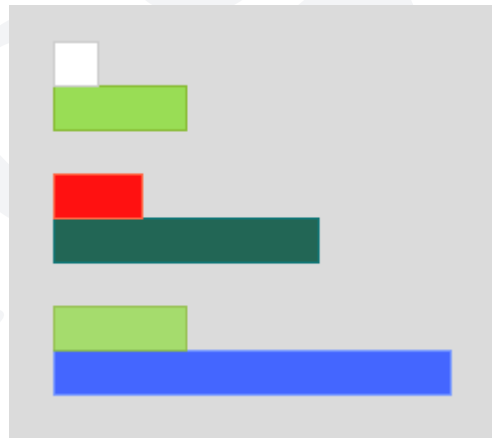


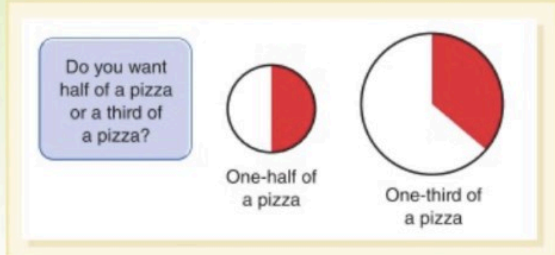
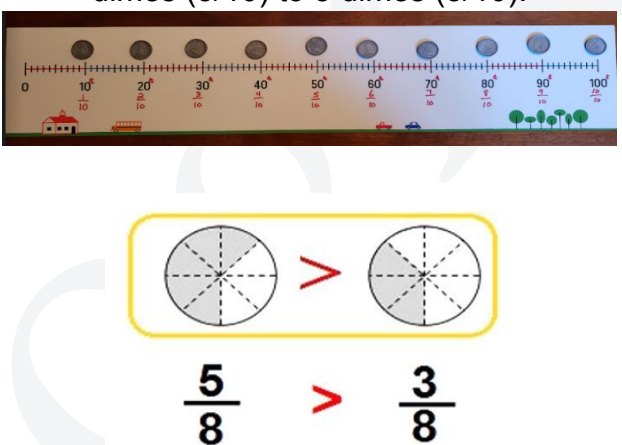
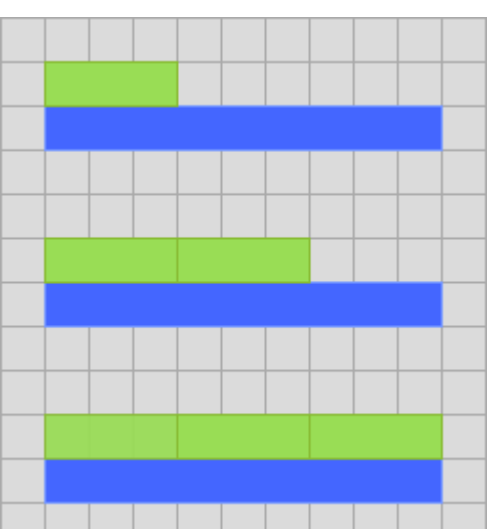
One $\frac{1}{5}$, two $\frac{1}{5}$ s, three $\frac{1}{5}$ s, four $\frac{1}{5}$ s, five $\frac{1}{5}$ s (or one whole).

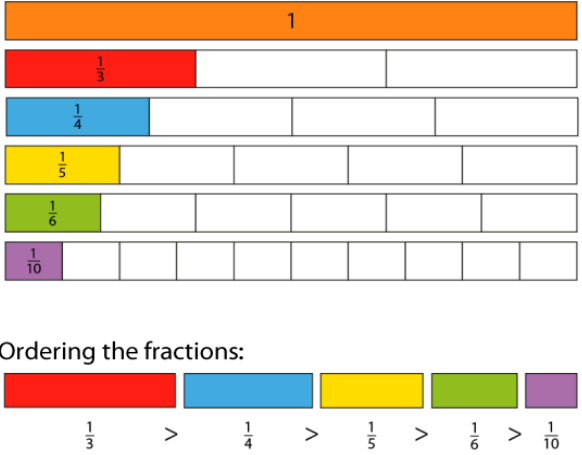
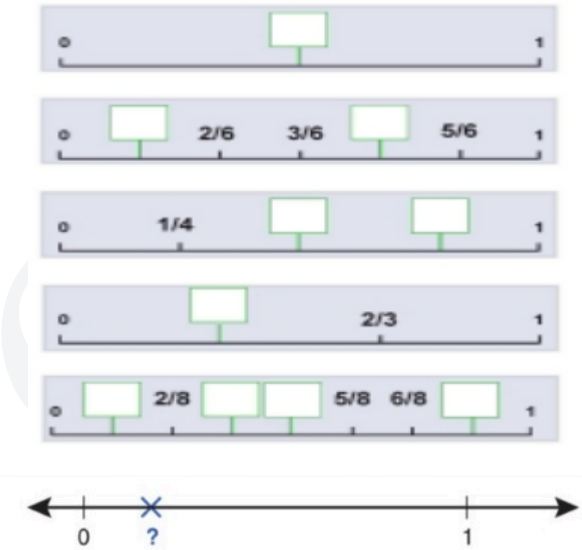
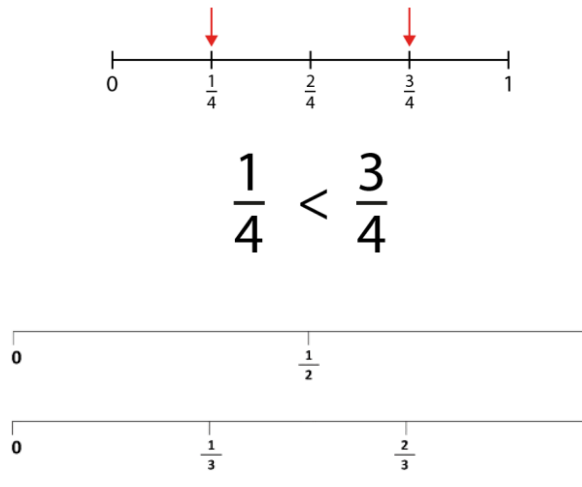
Consider using paper strips and folding the papers to create the unit fraction visuals.

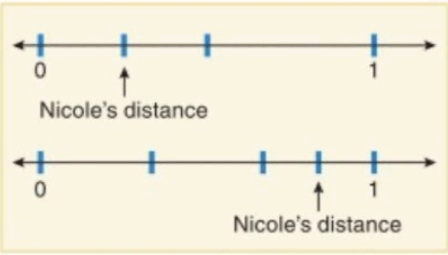
Suggest completing [page 25 from the NCETM resource](#).

		<p>Name a given fraction.</p>	<p>Name a fraction based on its composition as a number of a unit fraction.</p>	 <p>Three one-fourths Counting by unit fractions, this would be one $\frac{1}{4}$, two $\frac{1}{4}$'s, three $\frac{1}{4}$'s Using a measuring tape, count by $\frac{1}{8}$'s</p>  	<p>Unit Fraction on a Ruler - Deep</p> <p>Finding the Unit Fraction - Deep</p> <p>Cutting the Ribbon - Deep</p>
		<p>Identify the numerator and denominator of a fraction in various representations.</p> <p>Express fractions, including one whole, symbolically, limited to denominators of 12 or less.</p>	<p>Represent a given fraction of a whole using symbols.</p>	  <p>$\frac{3}{5}$ Three-fifths</p>	<p>Name Fractions - Surface</p> <p>Numerators and Denominators - surface</p>
		<p>Relate various representations of the same fraction, limited to denominators of 12 or less.</p>		  <p>$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$</p>	<p>Fraction Representations - deep</p>

				 <p style="text-align: center;">$4/8 = 2/4 = 1/2$</p>	
		<p>Compare the same fraction of different-sized wholes.</p>		<p>Comparing one-half of different sized wholes.</p>  <p>Comparing one-third of different sized wholes.</p>  <p>To illustrate, present students with the following problem :</p>	<p>Comparing Different Wholes - surface and deep</p>

				<p>Tristan is offered the choice of a third of a pizza or a half of a pizza. Since he is hungry and likes pizza, he chooses the half. His friend Jada gets a third of a pizza but ends up with more than Tristan. How is this possible?</p>  <p>One-half of a pizza One-third of a pizza</p>	
		<p>Compare different fractions of the same whole that have the same denominator.</p> <p>Express the relationship between two fractions of the same whole, using <, >, or =.</p>	<p>Compare different fractions of the same whole that have the same denominator.</p> <p>Express the relationship between two fractions of the same whole, using <, >, or =.</p>	<p>Use dimes (1/10 unit fraction) to compare 3 dimes (3/10) to 5 dimes (5/10).</p>  <p>$\frac{5}{8} > \frac{3}{8}$</p>  <p>$\frac{1}{3} < \frac{2}{3} < \frac{3}{3}$ $\frac{3}{9} < \frac{6}{9} < \frac{9}{9}$</p>	<p>Comparing Fractions with the Same Denominator - surface</p>

		<p>Compare different fractions of the same whole that have the same numerator and different denominators.</p> <p>Express the relationship between two fractions of the same whole, using $<$, $>$, or $=$.</p>	<p>Compare different fractions of the same whole that have the same numerator and different denominators.</p>	 <p>Ordering the fractions: $\frac{1}{3} > \frac{1}{4} > \frac{1}{5} > \frac{1}{6} > \frac{1}{10}$</p> <p>From NCETM page 25 $\frac{1}{2} > \frac{1}{3} > \frac{1}{4} > \frac{1}{5} \dots$</p>	<p>Comparing Fractions with Different Denominators - deep</p> <p>Making a Fraction to Compare - deep</p>
		<p>Relate a fraction less than one to its position on the number line, limited to denominators of 12 or less.</p>	<p>Order a given set of fractions by placing them on a number line with given benchmarks.</p>		<p>Fractions and Number Lines - deep</p> <p>Understanding Unit Fractions - deep and cumulative</p> <p>Fractions, Fractions and More Fractions - deep</p>
		<p>Compare fractions to benchmarks of 0, $\frac{1}{2}$, and 1</p> <p>Express the relationship between two fractions of the same whole, using $<$, $>$, or $=$.</p>	<p>Identify fractions that are greater than, less than, or equal to the benchmarks 0, $\frac{1}{2}$, and 1.</p> <p>Identify fractions between two given benchmarks on a number line.</p>		<p>Benchmarks 0 1/2 1 - surface</p> <p>Benchmarks Part 2 - Deep</p> <p>Labeled Unit Fractions (Answer Key for Benchmarks)</p> <p>Blank Unit Fraction Number line Templates (for Benchmark comparisons)</p>

					<p>How Far Did Nicole Go?</p> <p>Give students number lines partitioned such that only some of the partitions are showing. Use a context such as walking to school. For each number line, ask, "How far has Nicole gone? How do you know?"</p>  <p>Students can justify their reasoning by measuring the size of the sections that have been partitioned.</p>	
--	--	--	--	--	---	--

Resources

Mathology

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

Mathology Little Books

Mathology Little Book: [Hockey Homework](#)

Links to Other Grades

Mathology Little Book: [The Best Birthday](#) (2)

Mathology Activities

Mathology Grade 2: Number Activity 17: Early Fractional Thinking

Mathology Grade 3: Number Unit 4, Fractions: Activities 14-16

Mathology Grade 4: Number Activity 15: Exploring Different Representations of Fractions

Mathology Interactive Tools:

- [Model with a Number Line](#)
- [Relational Rods](#)
- [Strip Diagrams](#)
- [Fraction Strips](#)
- [Modelling Fractions](#)

Math UP

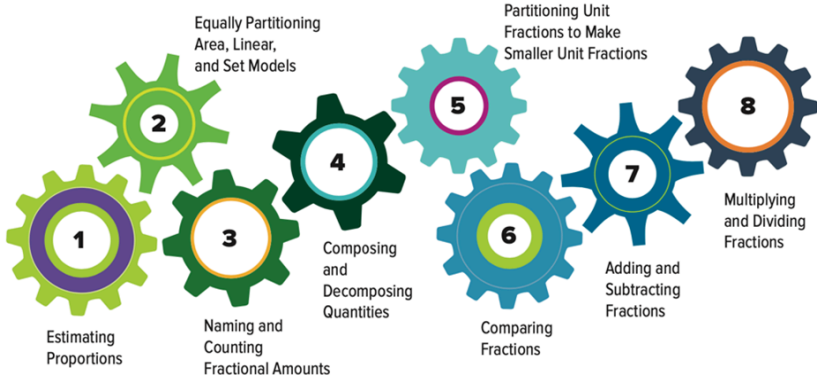
Grade 3

Representing Fractions

- Lesson 1: Describing the Partitioning of an Area Using a Fraction
- Lesson 2: Describing the Partitioning of a Set Using a Fraction
- Lesson 3: Different Ways to Represent Fractions
- Lesson 4: Fractions on the Number Line

Comparing and Ordering Fractions

- Lesson 1: Strategies for Comparing Fractions
- Lesson 2: Relating Numerators and Denominators to Estimate

<p>Existing Textbooks</p> <p>Math Makes Sense 3 Unit 5 Student Textbook pages 180-205</p> <p>Math Makes Sense 4 Unit 5 Student Textbook pages 178 - 179, 190 - 196 Note: emphasis is on 'unit fraction' understanding</p>	<p>NCETM (teacher guides and resources)</p> <p>NCETM - Preparing for fractions: the part-whole relationship (Spine 3; Year 3; 3.1)</p> <p>NCETM - Unit fractions: identifying, representing, and comparing (Spine 3; Year 3; 3.2)</p>
<p>Websites/Other</p> <p>Rethinking Fractions book (Introducing Rethinking Fractions: 8 Core Concepts to Support Assessment and Learning, Pearson Publishing)</p>  <p>Kentucky Intervention Guide KNP - provides great lessons and activities (outcomes based) for Teachers K-3</p> <p>Mathematics Developmental Continuum - Indicators of Progress Tasks/Activities (Australia)</p>	<p>Gizmos</p> <p>New Learn Alberta (Teacher Login Required)</p> <ul style="list-style-type: none"> Adding Fractions (Fraction Tiles) Equivalent Fractions (Fraction Tiles) Fraction Garden (Comparing Fractions) Fractions Greater than One (Fraction Tiles) Fraction, Decimal, Percent (Area and Grid Models) Modeling Fractions (Area Models) Percents, Fractions, and Decimals <p>ExploreLearning Gizmos Site:</p> <ul style="list-style-type: none"> Fraction Artist 1 (Area Models of Fractions) Fraction Artist 2 (Area Models of Fractions) Toy Factory (Set Models of Fractions) <p>For access to additional resources, request a Gizmos account alberta@explorellearning.com</p>
<p>Indigenous Lesson Plans and Resources</p> <p>Coming Soon</p>	<p>Problem Solving</p> <p>Coming Soon</p>



KUSPs 3N4

[Literacy Connections](#)

Literacy Connections

Title	Author	Format (Picture Book, Novel, Non-fiction, other)	Publisher	ISBN	Notes
Fraction Fun	David A. Adler	Picture Book	David A. Adler	0823413411, 978-0823413416	Denominators and Numerators
Fraction Action	Loreen Leedy	Picture Book	Holiday House; Illustrated edition (Jan. 1 1994)	082341244X, 978-0823412440	Fractions
Fractions in Disguise	Edward Einhorn	Picture Book	Charlesbridge	9781607347286, 1607347288	Fractions
A Fraction's Goal-Parts of a Whole	Brian P. Cleary	Picture Book	Millbrook Press; Illustrated edition (Aug. 1 2013)	1467713805, 978-1467713801	Parts of a whole, numerator, denominator
The Multiplying Menace Divides	Pam Calvert	Picture Book	Charlesbridge; Paper edition (Feb. 1 2011)	1570917825, 978-1570917820	Dividing whole numbers, dividing fractions by whole numbers, and whole numbers by fractions
Sir Cumference and the Fraction Faire	Cindy Neuschwander	Picture Book	Charlesbridge; Illustrated edition (March 7 2017)	1570917728, 978-1570917721	Numerator, denominator, parts of a whole
Ed Emberley's Picture Pie	Ed Emberley	Picture Book	LB Kids; Revised ed. edition (Feb. 1 2006)	0316789828, 978-0316789820	Fractions
Give Me Half!	Stuart J. Murphy	Picture Book	HarperCollins; Illustrated edition (April 1 1996)	9780064467018, 978-0064467018	Fractions
The Hershey's Milk Chocolate Bar Fractions Book	Jerry Pallotta	Picture Book	Scholastic, 1999	0439135192, 9780439135191	Fractions, parts of a whole