Unpacking the New Grade 5 Math

Provincial Group

December 5, 2023

Land Acknowledgment

We respectfully acknowledges that we are situated on Traditional lands across the province of Alberta home to many First Nations, including the Cree, Blackfoot, Métis, Nakota Sioux, Saulteaux, Inuit, and many others whose histories, languages, and cultures continue to influence our vibrant community.

Agenda for Today!

- identifying key skills and concepts in the part of our curriculum - Bridging!
- extending **strategies** for 5N4, 5N5 and starting 5N6
- Using money arrays to help support the unit fraction as we move towards improper fractions
- 12x12 mastery is ongoing
- place value review
- multiplication and division strategies - more review of division in February
- plotting points and areas on grids

Money in application to math facts to place value, addition, subtraction, multiplication and division of natural and decimal numbers.

Review of where we came from.

DRAFT **Sample Year at a Glance: Mathematics - Grade 5**

September 2022 ---------- November 2022

September	October	November
Number: Quantity is measured with numbers that enable counting, labelling, comparing and operating. (use money as concept/manipulative and consider FL)		
5N1 Students analyze patterns in place value • Place value symmetry extends infinitely to the left and right of the ones place. (introduce with basic money skills/fractions initially - unit fractions of denominator 10 & 100, number lines) 5N2 Students add and subtract within 1 000 000, including decimal numbers to thousandths, using standard algorithms. • Addition and subtraction of numbers with many digits is facilitated by standard algorithms.(initially whole numbers to 100 - 1 000) 5N4 Students multiply and divide natural numbers within 100 000, including with standard algorithms. (limit to math facts of 12x12 review, 2 digit x 1 and 2 digit multiplication) • Standard algorithms are efficient procedures for multiplication and division. * Review of math facts with different strategies should be ongoing	5N1 Students analyze patterns in place value • Place value symmetry extends infinitely to the left and right of the one's place. (introduce to hundredths in context, number lines, finding numbers between, compare and order) 5N2 Students add and subtract within 1 000 000, including decimal numbers to thousandths, using standard algorithms. • Addition and subtraction of numbers with many digits is facilitated by standard algorithms.(money values ($1.00 - $1000.00) 5N4 Students multiply and divide natural numbers within 100 000, including with standard algorithms. (limit to math facts of 12x12 review, 2 digit x 1 and 2 digit multiplication) • Standard algorithms are efficient procedures for multiplication and division. * Review of math facts with different strategies should be ongoing	5N1 Students analyze patterns in place value • Place value symmetry extends infinitely to the left and right of the one's place. (introduce to thousandths in context, number lines, finding numbers between, compare and order, rounding) 5N2 Students add and subtract within 1 000 000, including decimal numbers to thousandths, using standard algorithms. • Addition and subtraction of numbers with many digits is facilitated by standard algorithms.(estimation included) 5N3 Students determine divisibility of natural numbers • A number is divisible by another number if it can be divided with a remainder of 0. 5N4 Students multiply and divide natural numbers within 100 000, including with standard algorithms. • Standard algorithms are efficient procedures for multiplication and division 2 digit by 1 digit). * Review of math facts with different strategies should be ongoing

DRAFT Sample Year at a Glance: Mathematics - Grade 5

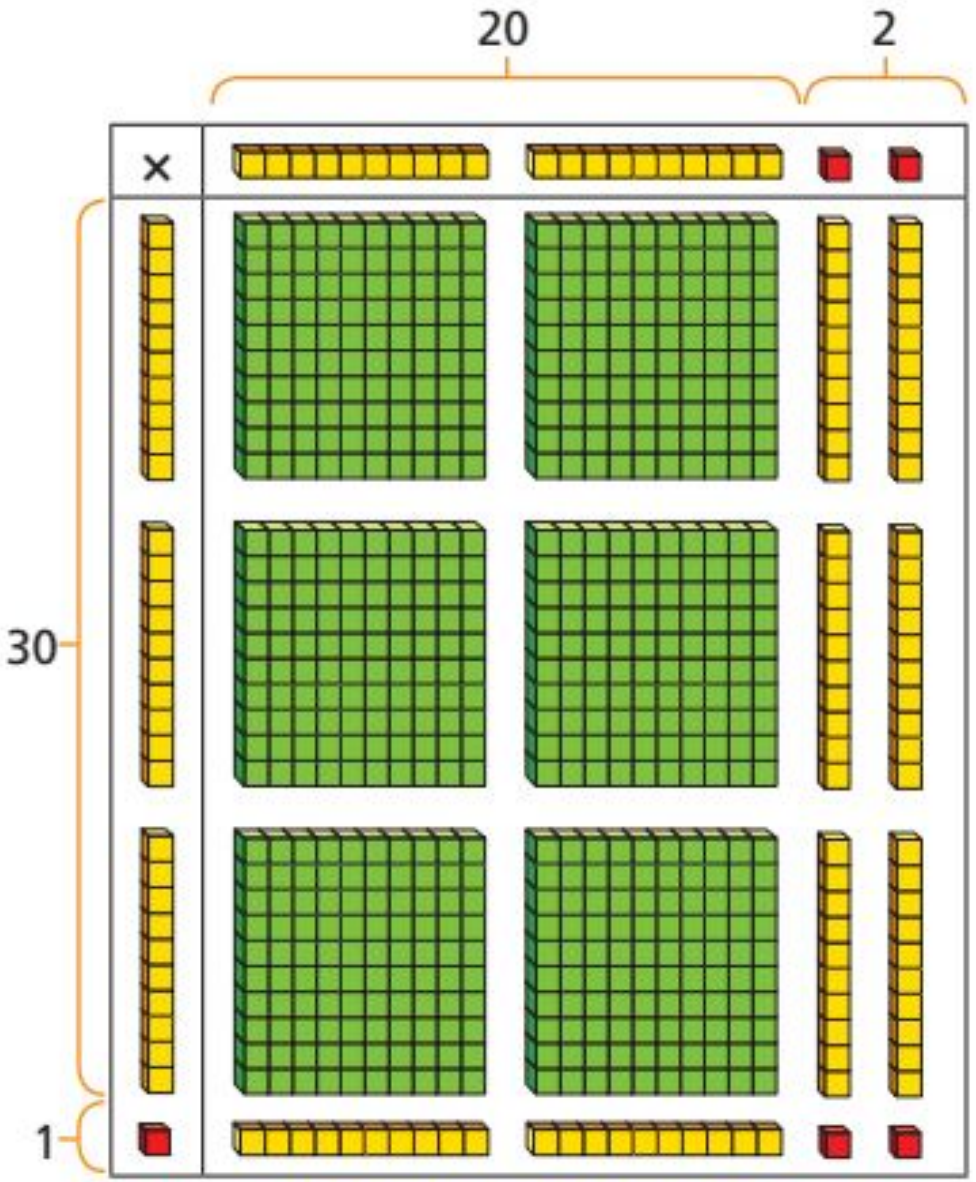
December 2022 ----------January 2023

December	January	February
Number: Quantity is measured with numbers that enable counting, labelling, comparing and operating.		
5N4 Students multiply and divide natural numbers within 100 000, including with standard algorithms. • Standard algorithms are efficient procedures for multiplication and division (3 digit by 1 digit, include alternate strategies for division). * Review of math facts with different strategies should be ongoing	5N5 Students interpret improper fractions. • Fractions allow counting and measuring between whole quantities. (begin with review of multiple different unit fractions on a number line, money to be focus) • Improper fractions and mixed numbers that represent the same number are associated with the same point on the number line. (leave for later) * Review of math facts with different strategies should be ongoing **Importance of putting fractions on a number line**	5N5 Students interpret improper fractions. • Fractions allow counting and measuring between whole quantities. • Improper fractions and mixed numbers that represent the same number are associated with the same point on the number line. (interpret related to money initially) 5N6 Students add and subtract fractions with common denominators. • Fractions with common denominators are multiples of the same unit fraction. • Properties for addition and subtraction of natural numbers apply to fractions. * Review of math facts with different strategies should be ongoing
Algebra: **Equations express relationships between quantities.**		
5A1.1 Students interpret numerical and algebraic expressions (link with 5N4) • Numerical expressions represent a quantity of known value. • Parentheses change the order of operations in a numerical expression	Finishing up with Numerical expressions	5A1.2 Students interpret numerical and algebraic expressions. • Algebraic expressions use variables to represent quantities of unknown value. • Algebraic expressions may be composed of one algebraic term or the sum of algebraic and

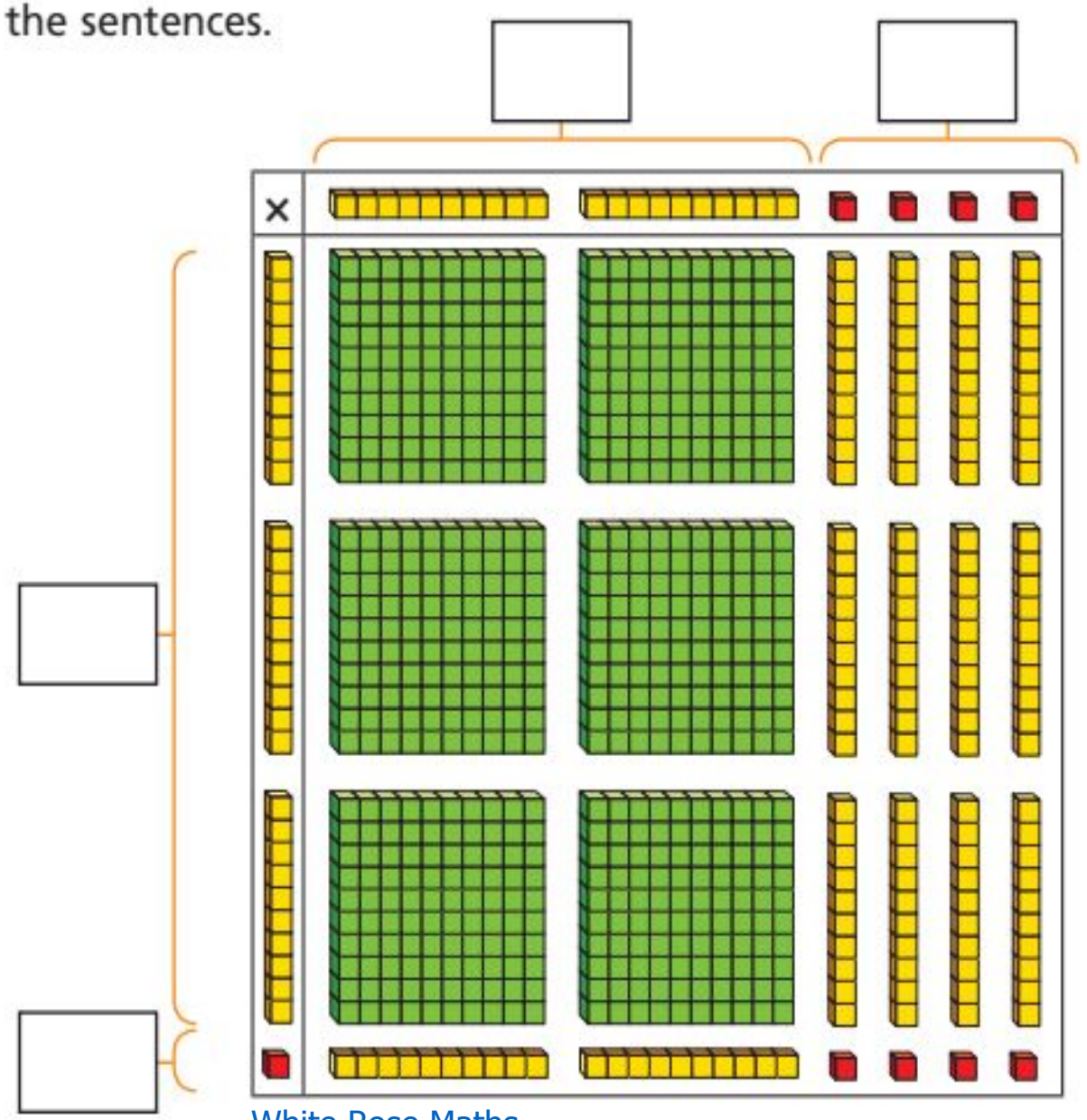
Guiding Question	In what ways can the processes of multiplication and division be articulated?		
Learning Outcome	5N4 Students multiply and divide natural numbers within 100 000, including with standard algorithms.		
	Knowledge	Understanding	Skills & Procedures
	Multiplication and division of numbers with many digits is facilitated by standard algorithms.	Standard algorithms are efficient procedures for multiplication and division.	Explain the standard algorithms for multiplication and division of natural numbers. Multiply up to 3-digit by 2-digit natural numbers using standard algorithms. Divide 3-digit by 1-digit natural numbers using standard algorithms. Express a quotient with or without a remainder according to context. Assess the reasonableness of a product or quotient using estimation. Solve problems using multiplication and division of natural numbers.

Providing additional strategies for multiplying and dividing will assist students in explaining the "standard algorithm".

Kim is using base 10 to work out 31 × 22



Add the missing information to the area model and complete the sentences.



Commutative Property

Allows Both to Work

17 x 439

400 + 30 + 9

10 + 7			

439 x 17

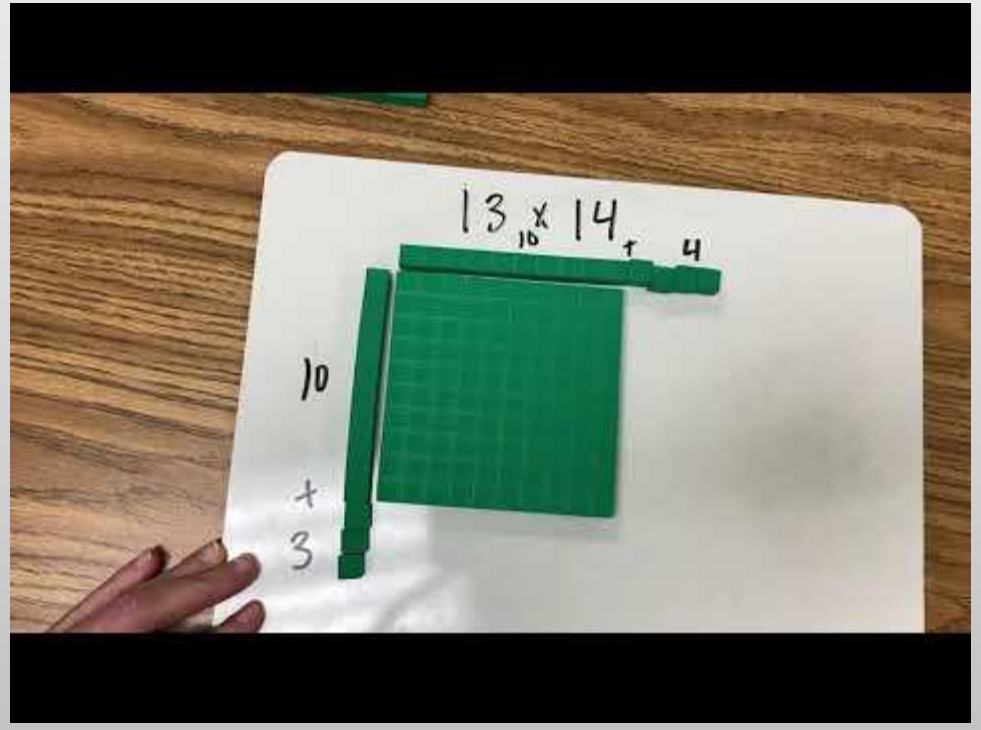
10 + 7

400 + 30 + 9		

BOX Method

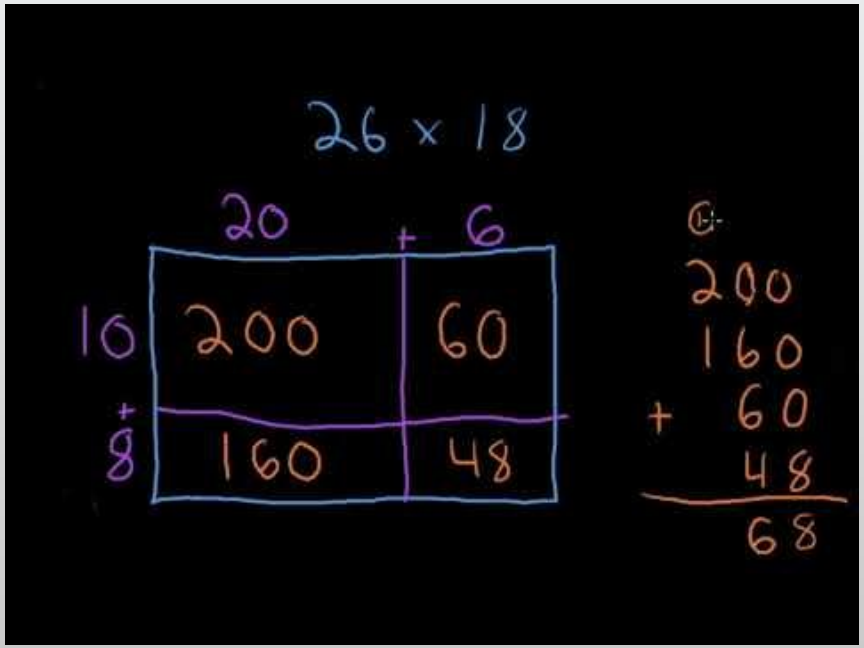
Allows students to break numbers apart into manageable pieces as well as not deal with regrouping.

Base 10 Blocks



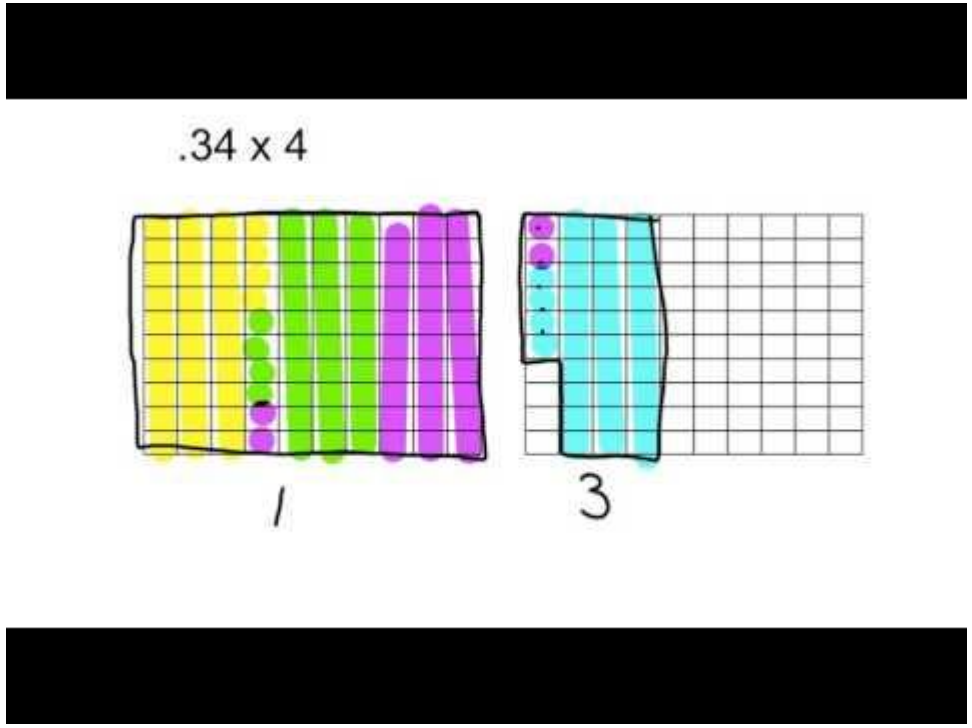
Math tip: Use base ten blocks to multiply 2 digit by 2 digit numbers. math Tips by Mrs. Townsend

Box Method (Partial Sums)



5th Grade | Multiplication | Area Model | Teaching Video: Mr. C

Some of our students who struggle may need to take the ***Box Method*** down one more step. Review Multiplication and Division alternate strategies.



Multiplying a decimal by a whole number using base 10 grid.
Kerri Woronka

Sample multiplication of a decimal by a natural number using a grid.

DRAFT **Sample Year at a Glance: Mathematics - Grade 5**

September 2022 ---------- November 2022

September	October	November
Geometry: Shapes are defined and related by geometric attributes.		
5G1.1 Students investigate symmetry as a geometric property (also tie into number line and place value, no rotational symmetry) • Symmetry is a property of shapes. Symmetry can be created and can occur in nature.(ensure use of visuals for symmetry)		5G1.1 Students investigate symmetry as a geometric property • Symmetry is a property of shapes. Symmetry can be created and can occur in nature. 5G1.2 Students investigate symmetry as a geometric property. • Symmetry is related to other geometric properties.
Coordinate Geometry:Location and movement of objects in space can be communicated using a coordinate grid.		
	5CG1 Students relate location to position on a grid. • Location can describe the position of shapes in space. • Location can be described precisely using a coordinate grid.	
Algebra: Equations express relationships between quantities.		
	5A1.1 Students interpret numerical and algebraic expressions.(tie into math facts, review order of operations) • Numerical expressions represent a quantity of known value. • Parentheses change the order of operations in a numerical expression	5A1.1 Students interpret numerical and algebraic expressions (5N2 link) • Numerical expressions represent a quantity of known value. • Parentheses change the order of operations in a numerical expression

RAFT Sample Year at a Glance: Mathematics - Grade 5

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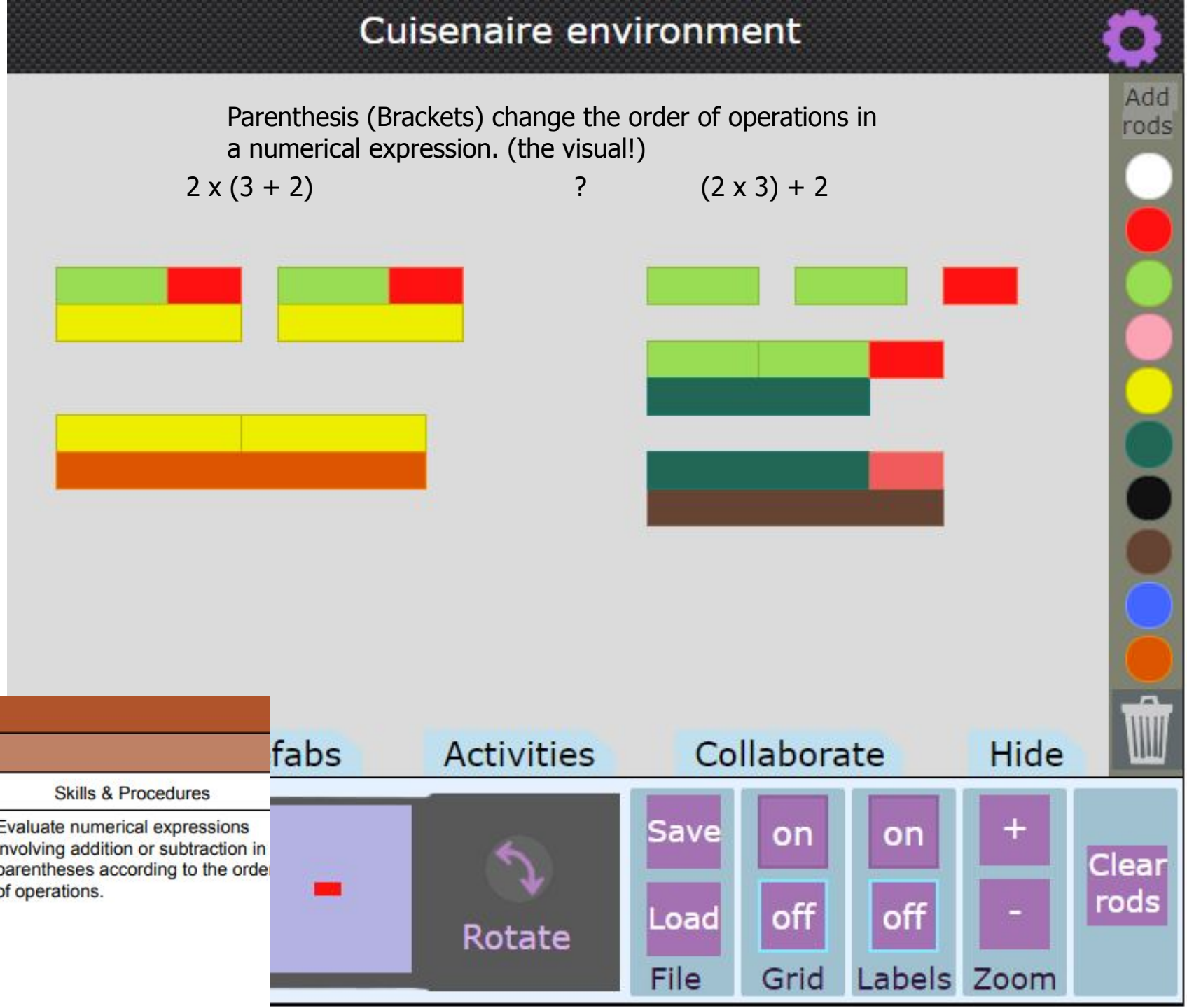
Algebra: **Equations express relationships between quantities.**		
5A1.1 Students interpret numerical and algebraic expressions (link with 5N4) • Numerical expressions represent a quantity of known value. • Parentheses change the order of operations in a numerical expression		5A1.2 Students interpret numerical and algebraic expressions. • Algebraic expressions use variables to represent quantities of unknown value. • Algebraic expressions may be composed of one algebraic term or the sum of algebraic and

GR.5 Could they Model it?
Show (4 + 6) - 3 ? 4 + (6 - 3)

Show
(6 ÷ 2) x 3 vs 6 ÷ (2 x 3)

Cuisenaire Rods



How can expressions enhance communication of number?

5A1.1 Students interpret numerical and algebraic expressions.

Knowledge	Understanding	Skills & Procedures
Numerical expressions with multiple operations may include parentheses to group numbers and operations. The conventional order of operations includes performing operations in parentheses before other operations.	Numerical expressions represent a quantity of known value. Parentheses change the order of operations in a numerical expression.	Evaluate numerical expressions involving addition or subtraction in parentheses according to the orde of operations.

5A1.2 Students interpret numerical and algebraic expressions.

Knowledge	Understanding	Skills & Procedures
Expressions that include variables are called algebraic expressions. A variable can be interpreted as a specific unknown value and is represented symbolically with a letter. Products with variables are expressed without the multiplication sign. Quotients with variables are expressed using fraction notation. An algebraic term is the product of a number, called a coefficient, and a variable. A constant term is a number. A variable can be replaced by a given number in order to evaluate an expression.	Algebraic expressions use variables to represent quantities of unknown value. Algebraic expressions may be composed of one algebraic term or the sum of algebraic and constant terms. Let's Consider Variables and Algebraic Expressions	Relate repeated addition of a variable to the product of a number and a variable. Express the product of a number and a variable using a coefficient. Express the quotient of a variable and a number as a fraction. Recognize a product with a variable, a quotient with a variable, or a number as a single term. Write an algebraic expression involving one or two terms to describe an unknown value. Evaluate an algebraic expression by substituting a given number for the variable.

December 2022 ----------January 2023		
December	**January**	**February**
		terms. (focus more on expressions and writing them in real contexts)
Measurement: Attributes such as length, area, volume and angle are quantified by measure.		
	5M1 Students estimate and calculate area using standard units. (can also use to review plotting points on a coordinate grid) • Area can be expressed in various units according to context and desired precision. • Rectangles with the same area can have different perimeters. (edited)	5M1 Students estimate and calculate area using standard units. • Area can be expressed in various units according to context and desired precision. • Rectangles with the same area can have different perimeters.
Patterns: Awareness of patterns supports problem solving in various situations.		

Use vertices of rectangles on the coordinate grid and determine the area - counting units or multiplying.

In what ways can area be communicated?		
5M1 Students estimate and calculate area using standard units.		
Knowledge	Understanding	Skills & Procedures
Area is expressed in the following standard units, derived from standard units of length: o o square centimetres o square metres square kilometres A square centimetre (cm^2) is an area equivalent to the area of a square measuring 1 centimetre by 1 centimetre. A square metre (m^2) is an area equivalent to the area of a square measuring 1 metre by 1 metre. A square kilometre (km^2) is an area equivalent to the area of a square measuring 1 kilometre by 1 kilometre. Among all rectangles with the same area, the square has the least perimeter.	Area can be expressed in various units according to context and desired precision. Rectangles with the same area can have different perimeters.	Relate a centimetre to a square centimetre. Relate a metre to a square metre. Relate a square centimetre to a square metre. Express the relationship between square centimetres, square metres, and square kilometres. Justify the choice of square centimetres, square metres, or square kilometres as appropriate units to express various areas. Estimate an area by comparing to a benchmark of a square centimetre or square metre. Express the area of a rectangle using standard units given the lengths of its sides. Compare the perimeters of various rectangles with the same area. Describe the rectangle with the least perimeter for a given area. Solve problems involving perimete and area of rectangles.

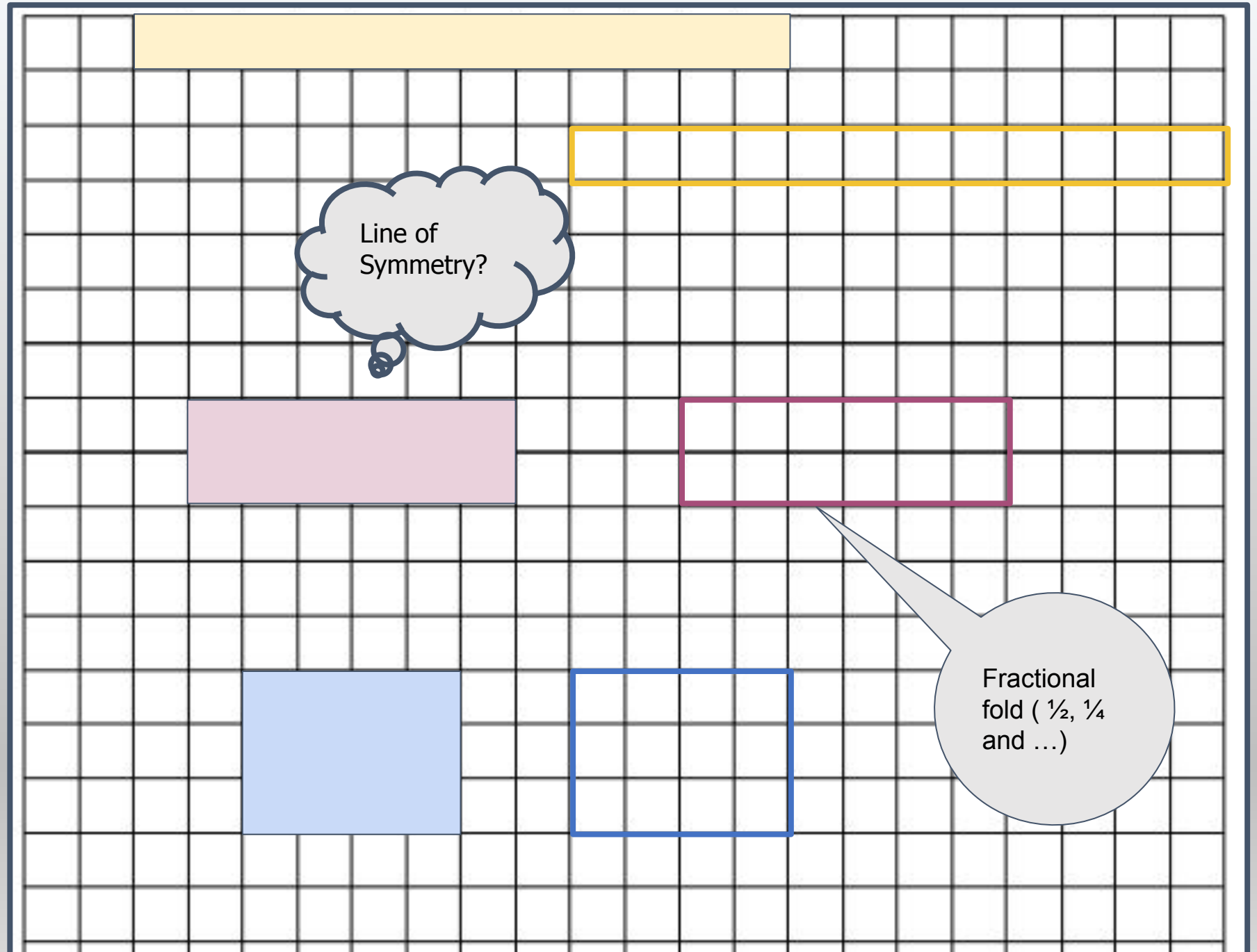
Sample activity

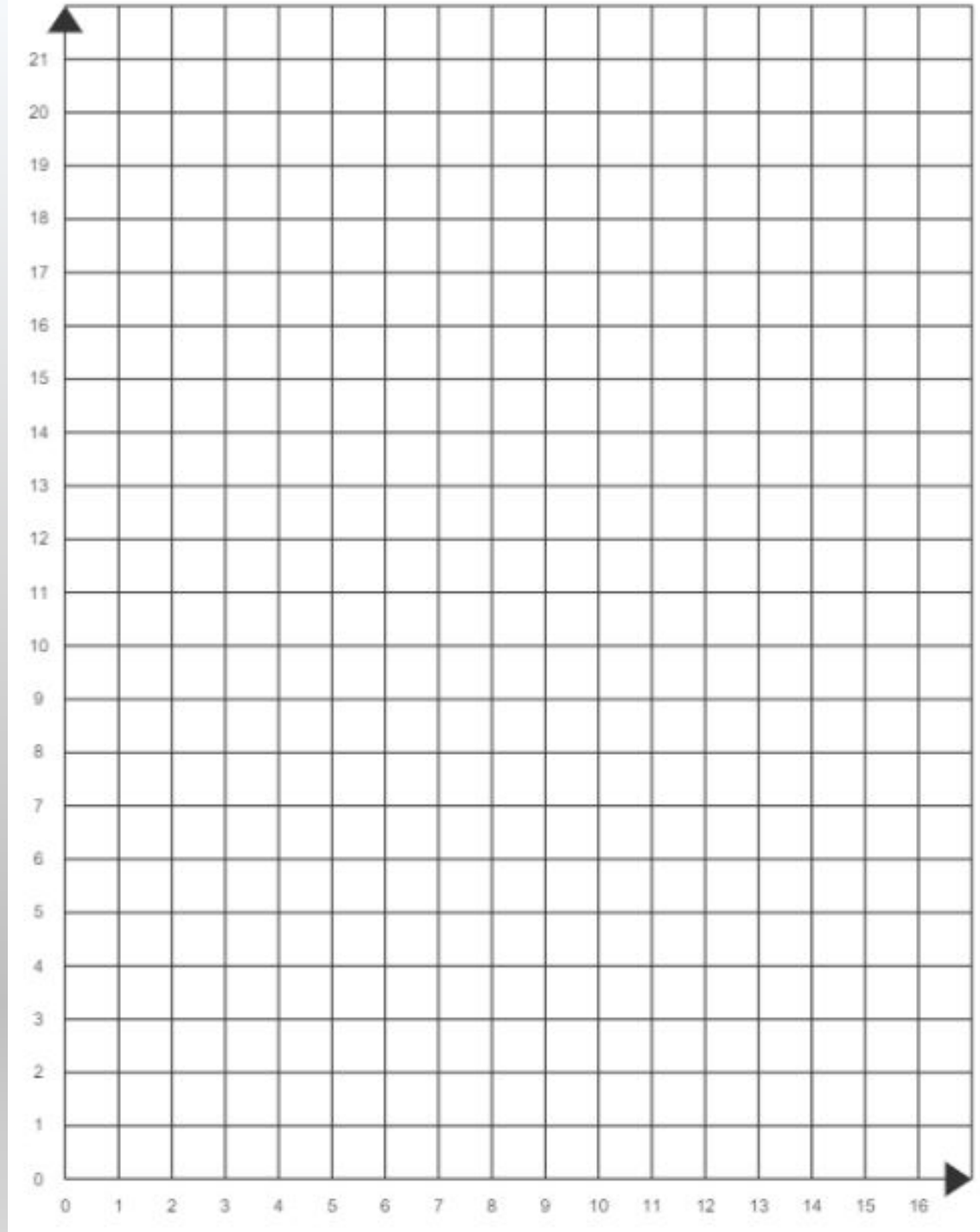
Provide students with 1 cm grid paper and ask them to draw all the rectangles they can with an area of 12 sq cm.

Have them label the lengths of the sides and then determine perimeter -

What is the difference between perimeter and area?

Grid Paper


Line of Symmetry?
Fractional fold (½, ¼ and …)



Deeper Thinking

Plot (4, 5), (9,5), (4, 10), (9, 10)

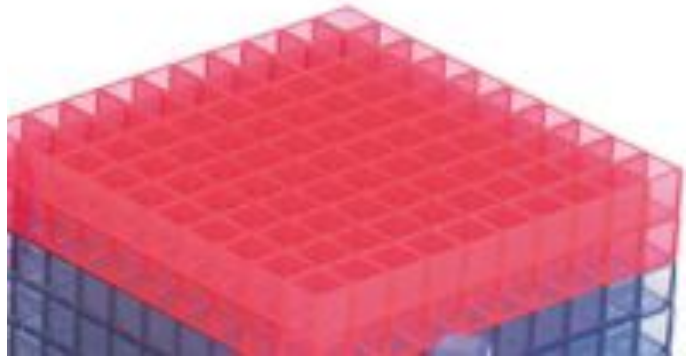
How many squares does the rectangle cover?
What is the perimeter?
Can it be folded in ½? Symmetrical?

Reviewing Place Value

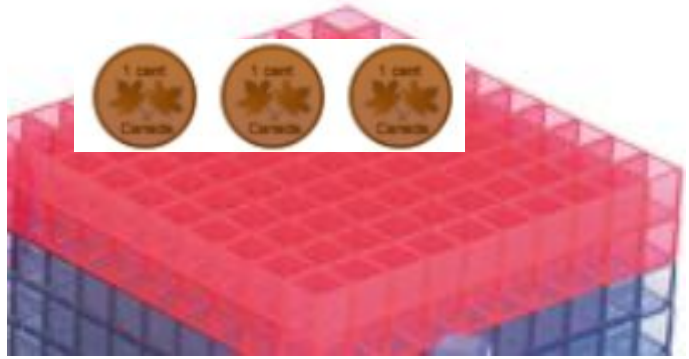
Place Value Chart Beginning with Money (Penny, Dime, Loonie, $10, $100, $1000)

 (not legal tender)					

As of January 1, 2021, the $1, $2, $25, $500 and $1,000 bills from every Bank of Canada series are no longer legal tender.



Show me 103 cents



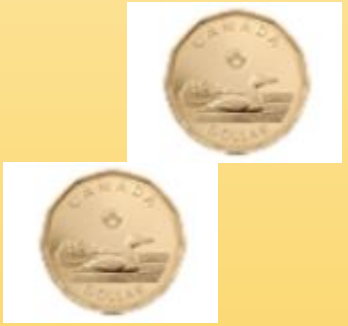
How can we meet these outcomes and leverage money in the process?

TENS

Ones

Answer:

Can you convert and Trade?



How else can we make $68.00

Work on Mastery to 100

Tens

Ones

What number is this?
What digit is in the tens place?
How many tens in this number?
How many ones in this number?

What number is this?
What digit is in the tens place?
How many tens in this number?
How may ones in this number?

How many tens in...

How many ones?

Work on Mastery to 100

Hundreds

Tens

Ones

What number is this?

What digit is in the tens place?

How many tens in this number?

How many ones in this number?

$100

$10

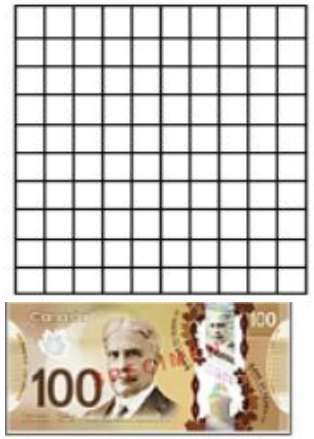
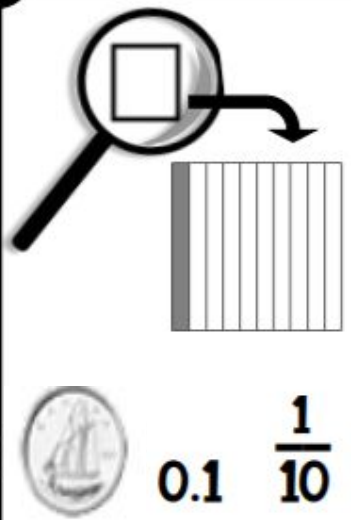
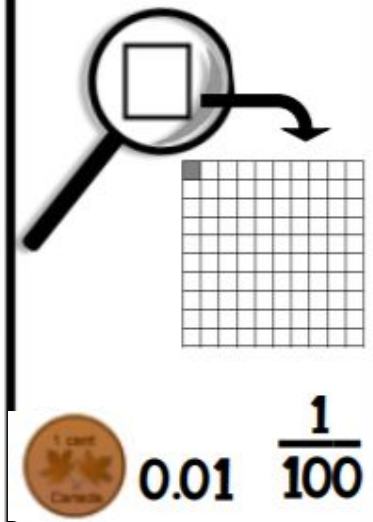
$1

$100	$10	$1
		
4	3	4

$13.15 + $13.15

13.15
<u>13.15</u>
26.30

$13.15 x 2
1
13.15
<u>x 2</u>
26.30

Hundreds	Tens	Units	Tenths	Hundredths
 100.00	 10.00	 1.00	 0.1 $\frac{1}{10}$	 0.01 $\frac{1}{100}$

Real World Context

Resources

Math Makes Sense 5 (Pearson)
Unit 3 Pages 71 -117

Math Focus 5 (Nelson)
Chapter 2 Pages 48 -78
Chapter 6 Pages 198 - 215

CPAR Documents

Multiplication and Division of Multi-Digit Numbers:

students multiply multi-digit whole numbers using the standard algorithm and begin working toward end-of-grade expectation for fluency. They also find whole-number quotients with up to four-digit dividends and two-digit divisors. Resource contains a TEachers Guide and Student resource.
Source: Core Knowledge

Resources

Grade 4 & 5 Ontario Math - Multiplication and Division of Numbers (Area Models and Problems)
https://cubeforteachers.com/folders/R4TZ6ifWVheowpL3XlQ9mSQnC161UEes6riXb0Rz0X7LcXvuTmZ6IANxrDSSOBIu?q=5.B2.6&idx=posts&p=0

https://cubeforteachers.com/folders/uQLGiZSylxmhQMNFRnIHxeYeQBptrEma9oyvJpFujtN2L9AsaDsmI3EVrAgcQAGz?q=4.B2.6&idx=posts&p=0

Grade 5 Ontario Math - Addition and Subtraction tenths and hundredths
https://cubeforteachers.com/folders/R4TZ6ifWVheowpL3XlQ9mSQnC161UEes6riXb0Rz0X7LcXvuTmZ6IANxrDSSOBIu?q=5.B2.4&idx=posts&p=0

Grade 5 Ontarion Math - Multiplication of Two digit whole numbers
https://cubeforteachers.com/folders/R4TZ6ifWVheowpL3XlQ9mSQnC161UEes6riXb0Rz0X7LcXvuTmZ6IANxrDSSOBIu?q=5.B2.6&idx=posts&p=0

Grade 5 Ontario Math - Divide whole numbers using a variety of strategies.
https://cubeforteachers.com/folders/R4TZ6ifWVheowpL3XlQ9mSQnC161UEes6riXb0Rz0X7LcXvuTmZ6IANxrDSSOBIu?q=5.B2.7&idx=posts&p=0

Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.		
Guiding Question	In what ways can fractions communicate numbers greater than one?		
Learning Outcome	5N5 Students interpret improper fractions.		
	Knowledge	Understanding	Skills & Procedures
	A fraction can represent quantities greater than one. An improper fraction has a numerator that is greater than its denominator. Natural numbers can be expressed as improper fractions with a denominator of 1. A mixed number of the form $A\frac{b}{c}$, composed of a number of wholes, A, and a fractional part, $\frac{b}{c}$, can represent an improper fraction. **Provide a real world context of an improper fraction - begin with unit fraction counting.**	Fractions allow counting and measuring between whole quantities. Improper fractions and mixed numbers that represent the same number are associated with the same point on the number line. **Unit Fractions with money is a great link.**	Relate fractions, improper fractions, and mixed numbers to their positions on the number line. Count beyond 1 using fractions with the same denominator. Model fractions, including improper fractions and mixed numbers, using quantities, lengths, and areas. Express improper fractions and mixed numbers symbolically. Express an improper fraction as a mixed number and vice versa. Compare fractions, including improper fractions and mixed numbers, to benchmarks of 0, $\frac{1}{2}$ and 1.

So what does the research tell us about fractions and Number lines ?

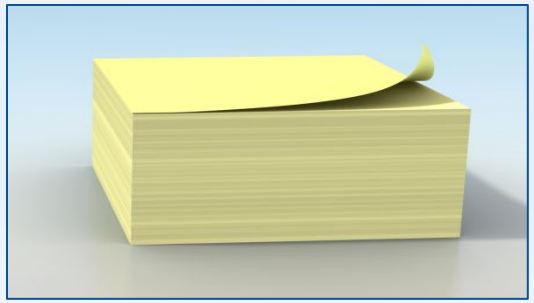
An opportunity for a re-consider!

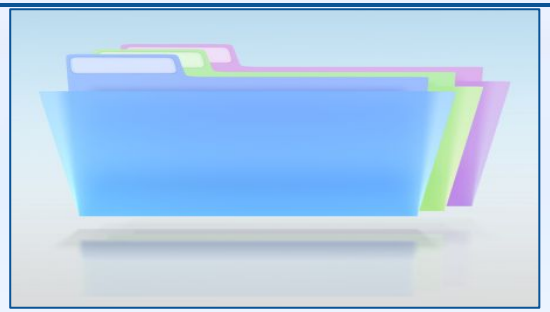
Number Line

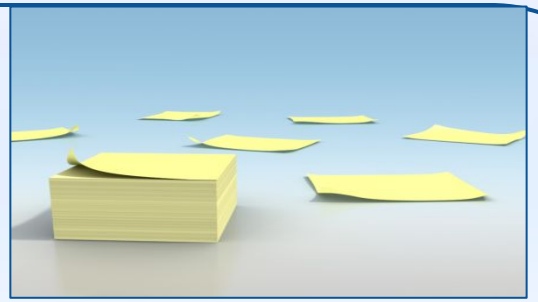
Students Internalize Concepts (near, far, more, less, before, after, one more or two more)

Students can compare numbers

Teachers must build vocabulary throughout the activity







- Fractions involve difficult-to-learn and difficult-to-teach concepts that present ongoing pedagogical challenges to the mathematics education community.

- These difficulties begin early in the primary years (Empson & Levi, 2011; Moss & Case, 1999) and persist through middle school (Armstrong and Larson, 1995; Kamii and Clark, 1995), then into secondary and even tertiary education (see Orpwood, Schollen, Leek, Marinelli-Henriques, & Assiri, 2011).

- The challenges and misunderstandings students face in understanding fractions (Gould, Outhred, & Mitchelmore, 2006; Hiebert 1988; NAEP, 2005) persist into adult life and pose problems in such wide-ranging fields as medicine and health care, construction and computer programming.

So what did the research tell us?

1

Understanding:
the roles and relationships between the numbers

1/3 > 1/2

2

Moving to Algorithms too quickly:
models removed quickly, symbolic terminology, procedural

3

Inconsistent Language

"2 over 5" or "2 out of 5" is actually "two fifths"

4

Lack of Connection to Previous Learning:
assume it is obvious a child knows what a fraction represents; real world connections

5

Unit Fraction Glance:

insufficient time devoted to the concept of the "unit" fraction as opposed to algorithms and mathematical definitions.

6

The 'Why' of the Rules:
Lack of time devoted to why we do what we do;connections to unit fraction.

7

Representing -
Over-emphasis on Part-Whole:
Fractions are not only part-whole, many other representations

8

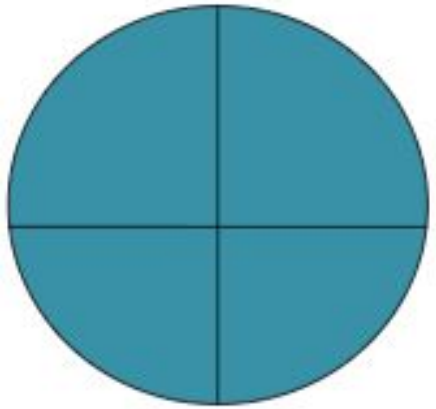
North-American overuse of Circles:
Circles offer us limited understanding when first learning fractions

Chris Zarski

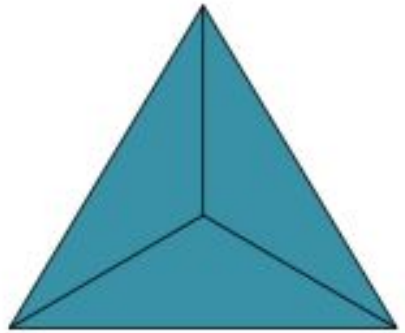
Bruce,C. *Actions to Develop Fraction Understanding*

Avoid this ‘count and fill in’ type of worksheet soon after we talk about a unit fraction.

Find the unit fraction for these diagrams



$\frac{1}{\square}$



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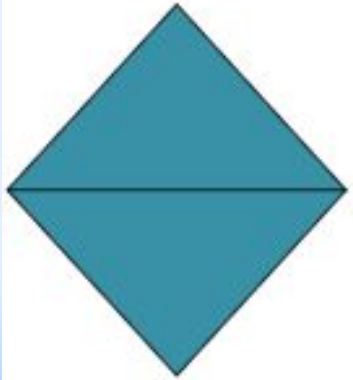
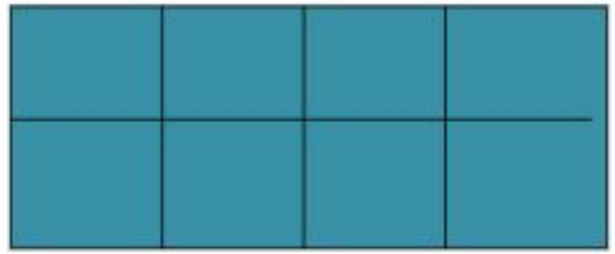
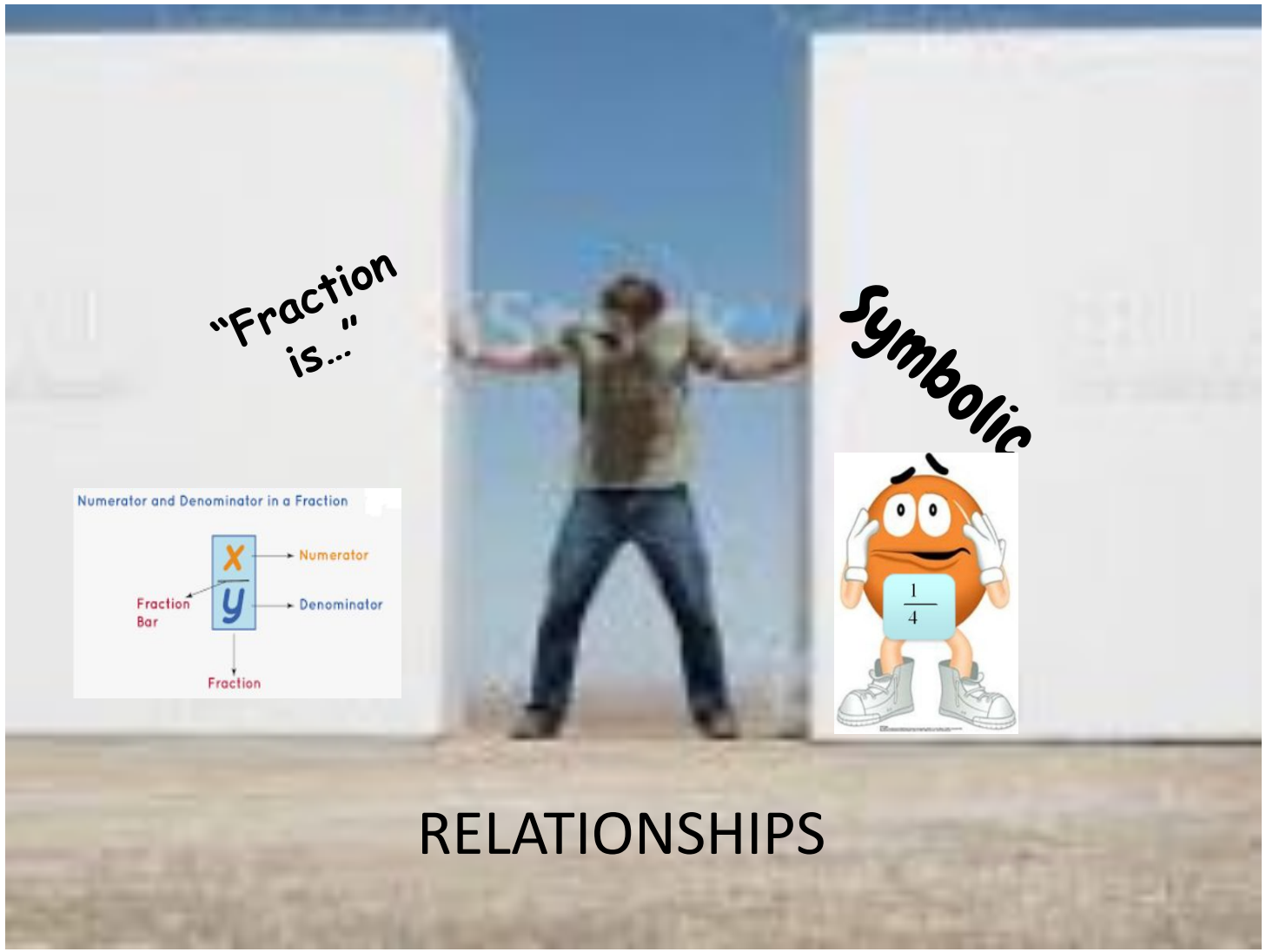


$\frac{1}{\square}$



$\frac{1}{\square}$



Chris Zarski

WHAT IS A FRACTION?

A fraction is a number which can tell us about the relationship between two quantities.

Chris Zarski

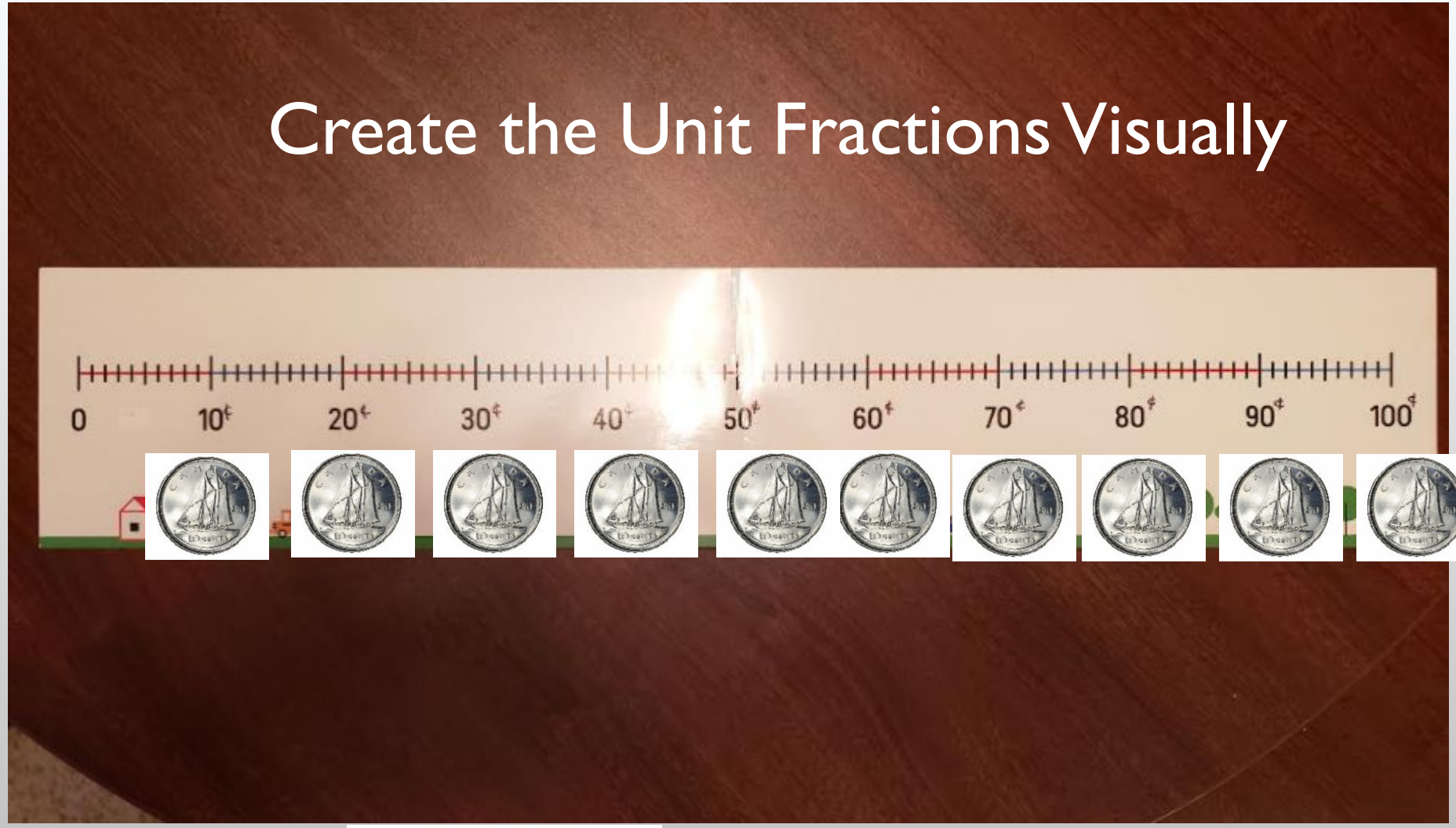
Let’s move to Unit Fractions and Money

In what ways can fractions communicate numbers greater than one?

5N5 Students interpret improper fractions.

Knowledge	Understanding	Skills & Procedures
A fraction can represent quantities greater than one. An improper fraction has a numerator that is greater than its denominator. Natural numbers can be expressed as improper fractions with a denominator of 1. A mixed number of the form $A\frac{b}{c}$, composed of a number of wholes, A, and a fractional part, $\frac{b}{c}$, can represent an improper fraction.	Fractions allow counting and measuring between whole quantities. Improper fractions and mixed numbers that represent the same number are associated with the same point on the number line.	Relate fractions, improper fractions, and mixed numbers to their positions on the number line. Count beyond 1 using fractions with the same denominator. Model fractions, including improper fractions and mixed numbers, using quantities, lengths, and areas. Express improper fractions and mixed numbers symbolically. Express an improper fraction as a mixed number and vice versa. Compare fractions, including improper fractions and mixed numbers, to benchmarks of 0, $\frac{1}{2}$ and 1.

Create the Unit Fractions Visually



[Money]

February

How can the composition of fractions facilitate operating with fractions?		
5N6 Students add and subtract fractions with common denominators.		
Knowledge	Understanding	Skills & Procedures
Fractions with common denominators can be composed or decomposed to model the change in a quantity of unit fractions. Addition and subtraction of fractions with common denominators does not change the unit fraction from which they are composed. Fractions greater than one can be added or subtracted as mixed numbers or improper fractions.	Fractions with common denominators are multiples of the same unit fraction. Properties for addition and subtraction of natural numbers apply to fractions.	Investigate the composition and decomposition of a quantity within 1 using unit fractions. Express the composition or decomposition of fractions with common denominators as a sum or difference. Compare strategies for adding or subtracting improper fractions to strategies for adding or subtracting mixed numbers. Add and subtract fractions with common denominators within 100, including improper fractions and mixed numbers. Solve problems requiring addition and subtraction of fractions with common denominators, including improper fractions and mixed numbers.

Ontario Math 5 Equivalent Fractions

MathLinks 7
Chapter 6 Student Book
Pages 210 - 224

Chapter 7 Pages 245 - 250 (like denominator questions only)

February

We will revisit the visuals and operations of fractions. They should be very comfortable with Unit Fractions

$$\frac{1}{10}$$

Numerator
(1 dime)

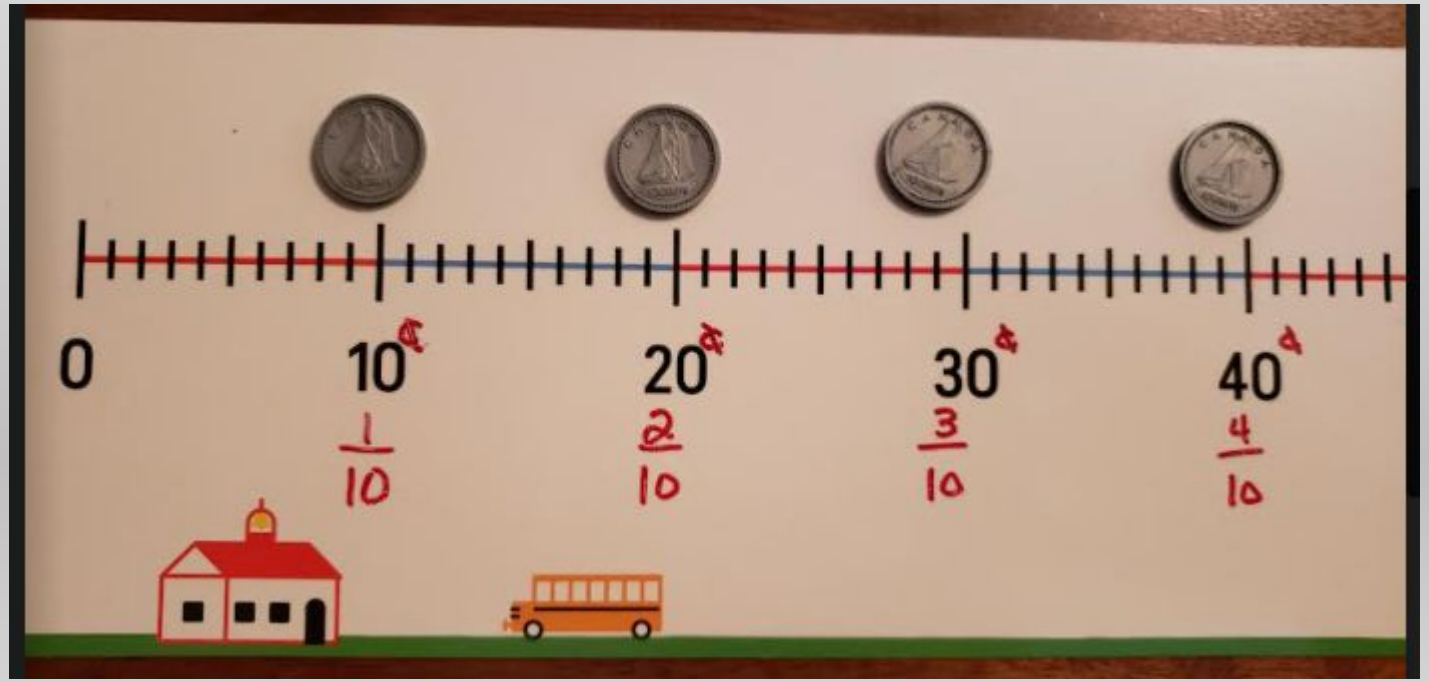
Denominator (10 dimes for 1 dollar)

Same coin being represented

Dimes in the middle row
Label all numbers with cents

Adapted from Number lines from Didax Company

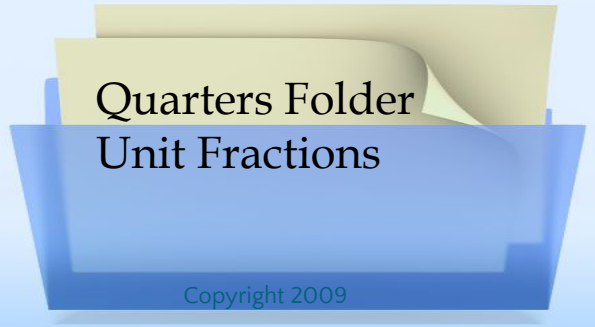

0
10¢
1/10
20¢
2/10
30¢
3/10
40¢
4/10
50¢
5/10
60¢
6/10
70¢
7/10
80¢
8/10
90¢
9/10
100¢
10/10

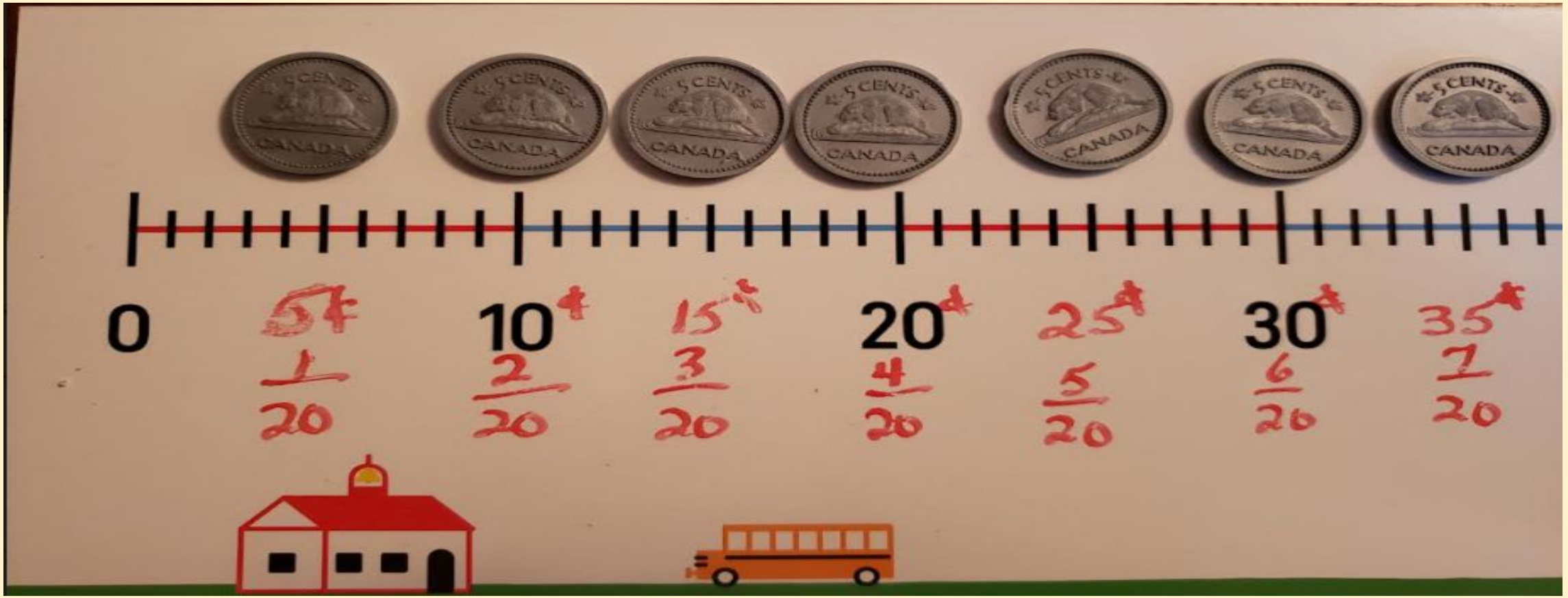

0
10¢
1/10
20¢
2/10
30¢
3/10
40¢
4/10

•Using more money for unit fractions

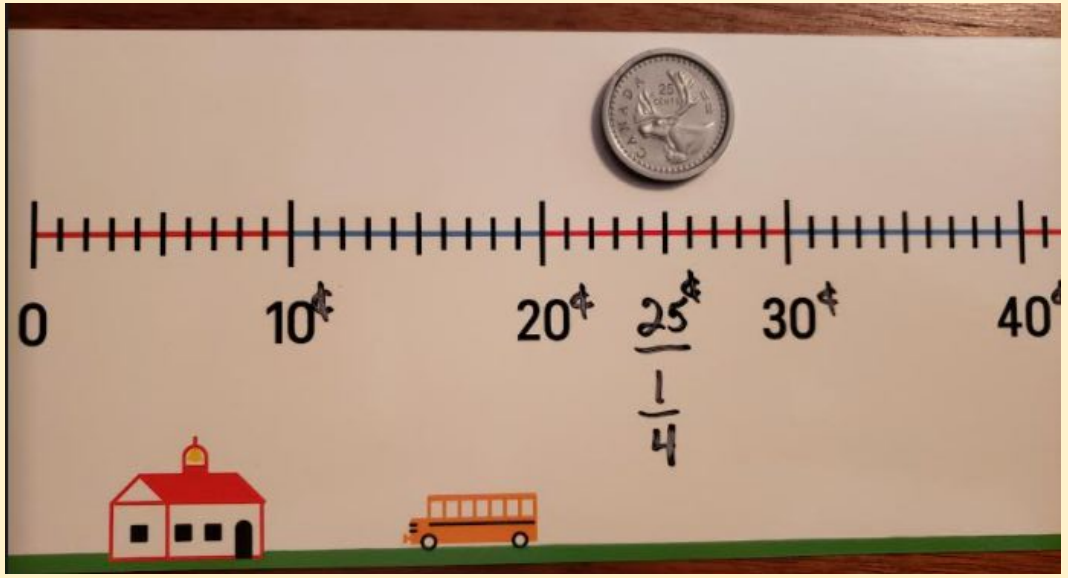
Use the top line to complete the nickels unit fractions

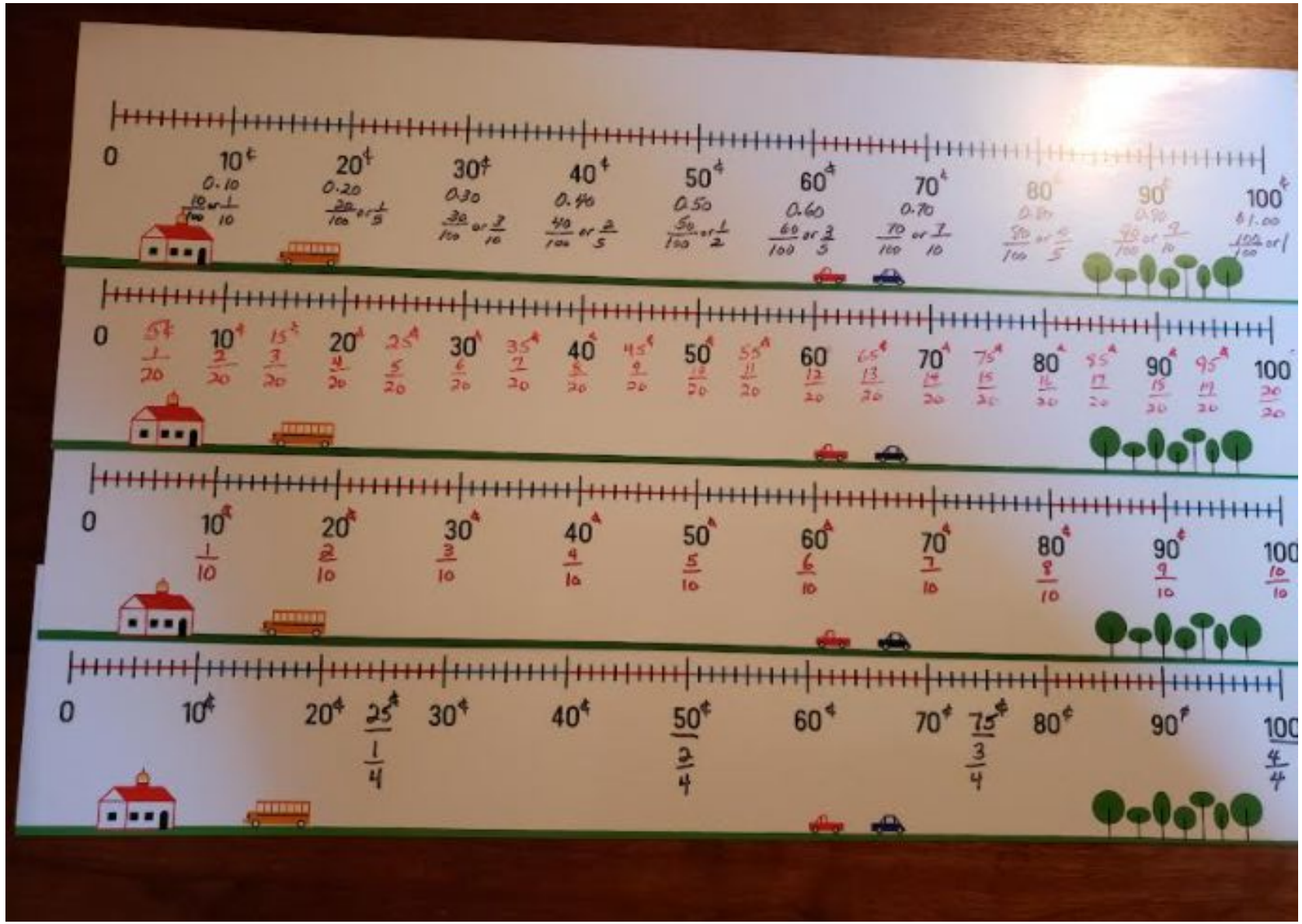
Use the bottom line to complete the quarters unit fractions

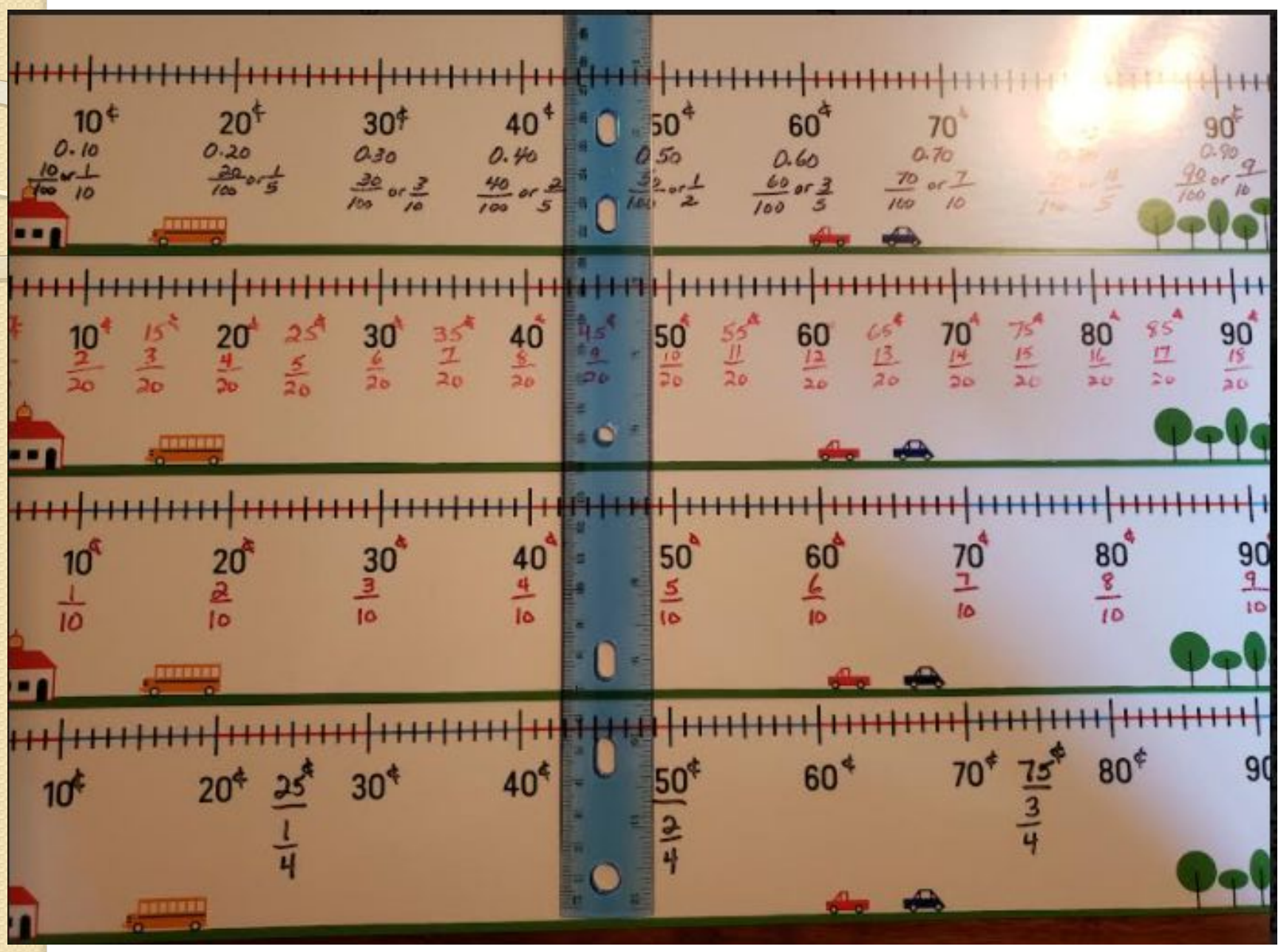


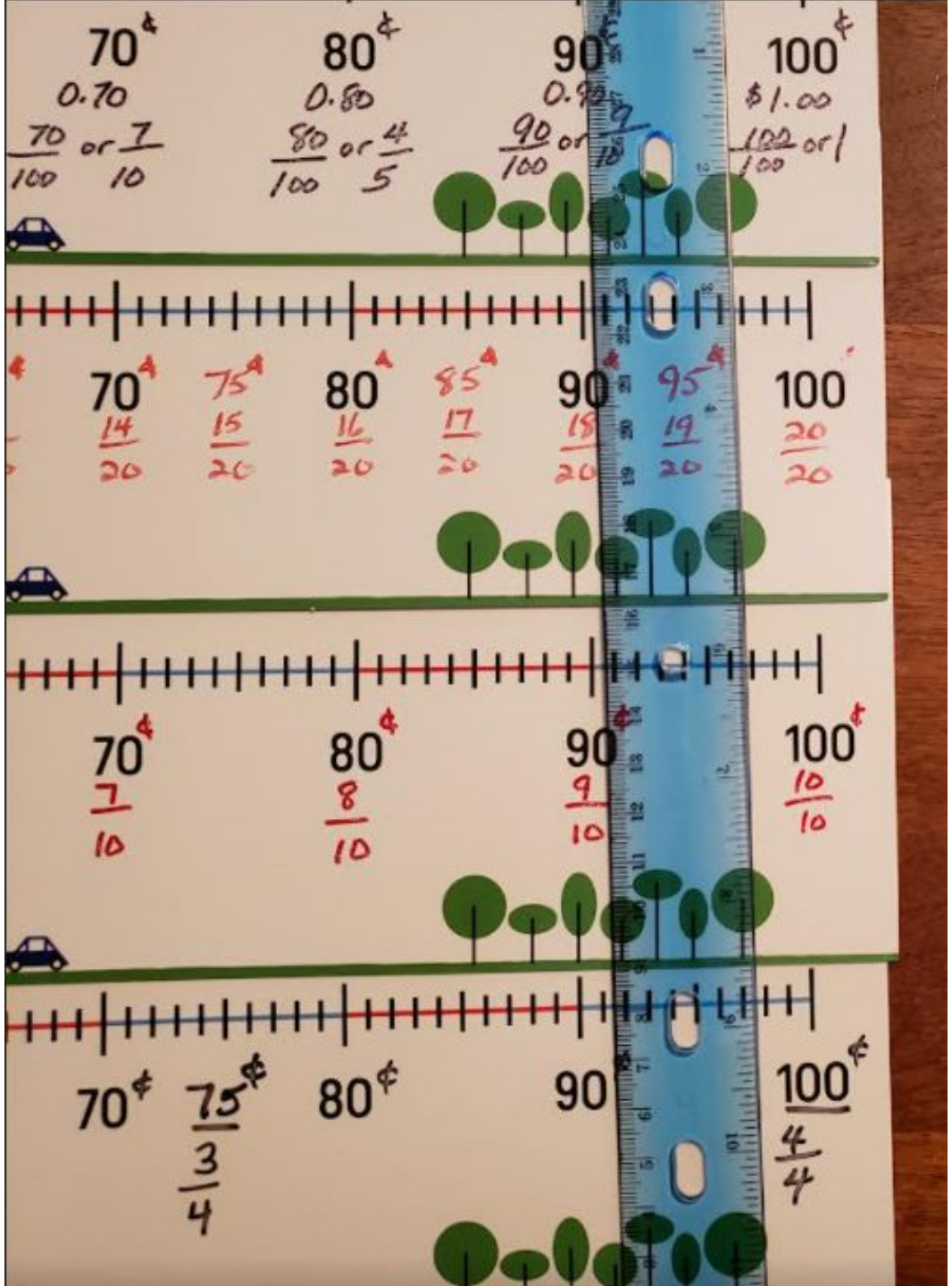

5 CENTS
CANADA
0
5¢
1/20
10¢
2/20
15¢
3/20
20¢
4/20
25¢
5/20
30¢
6/20
35¢
7/20

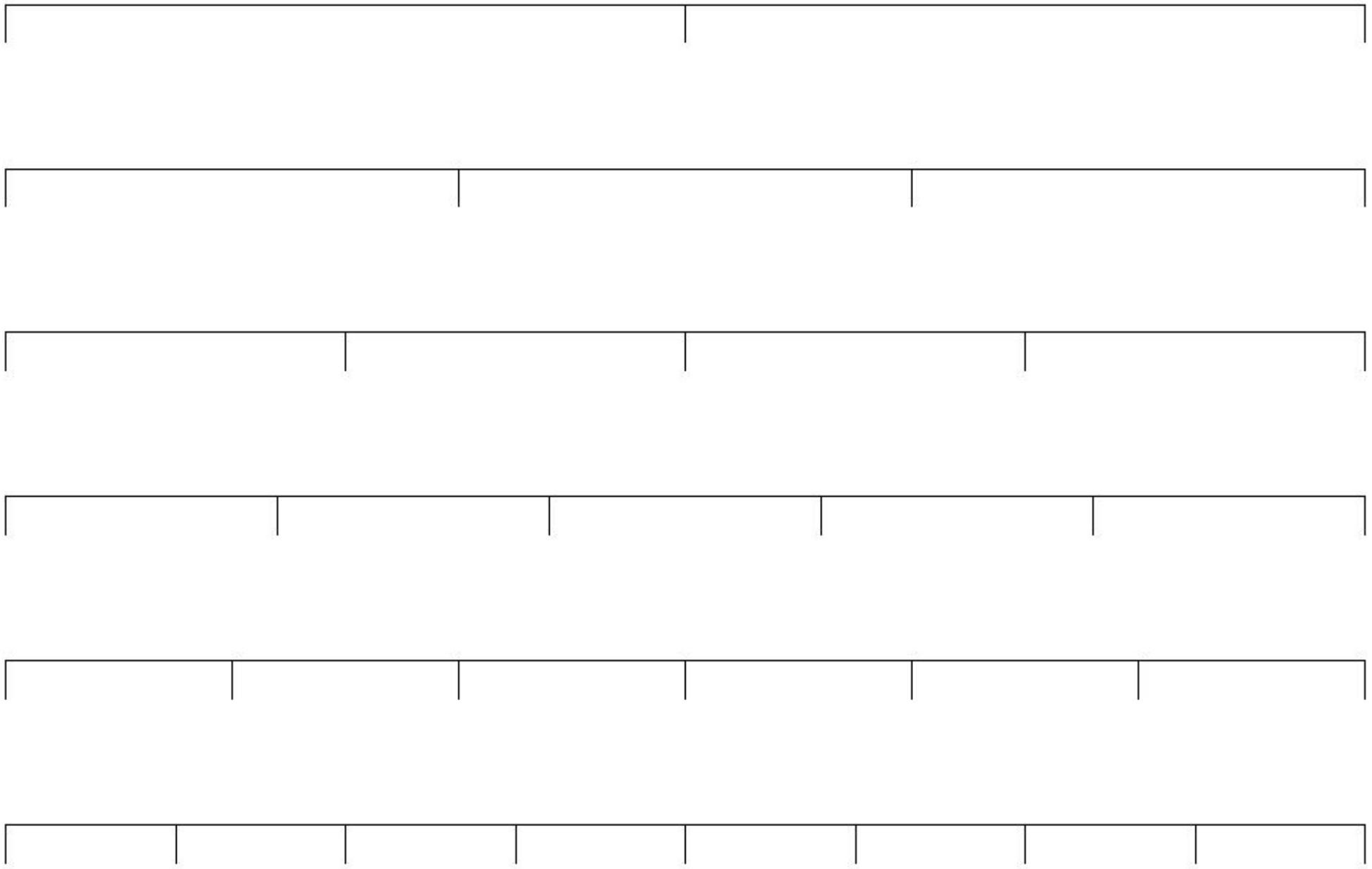

0
10¢
20¢
25¢
1/4
30¢
40¢
50¢
2/4
60¢
70¢
75¢
3/4
80¢
90¢
100¢
4/4


0
10¢
20¢
25¢
1/4
30¢
40¢


0
10¢
0.10
10/100 or 1/10
20¢
0.20
20/100 or 1/5
30¢
0.30
30/100 or 3/10
40¢
0.40
40/100 or 2/5
50¢
0.50
50/100 or 1/2
60¢
0.60
60/100 or 3/5
70¢
0.70
70/100 or 7/10
80¢
90¢
100¢
$1.00
100/100 or 1
0
5¢ 1/20
10¢ 2/20
15¢ 3/20
20¢ 4/20
25¢ 5/20
30¢ 6/20
35¢ 7/20
40¢ 8/20
45¢ 9/20
50¢ 10/20
55¢ 11/20
60 12/20
65¢ 13/20
70¢ 14/20
75¢ 15/20
80¢ 16/20
85¢ 17/20
90¢ 18/20
95¢ 19/20
100 20/20
0
10¢ 1/10
20¢ 2/10
30¢ 3/10
40¢ 4/10
50¢ 5/10
60¢ 6/10
70¢ 7/10
80¢ 8/10
90¢ 9/10
100 10/10
0
10¢
20¢
25¢ 1/4
30¢
40¢
50¢ 2/4
60¢
70¢
75¢ 3/4
80¢
90¢
100 4/4


10¢ 20¢ 30¢ 40¢ 50¢ 60¢ 70¢ 90¢
0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.90
10/100 or 1/10 20/100 or 1/5 30/100 or 3/10 40/100 or 2/5 50/100 or 1/2 60/100 or 3/5 70/100 or 7/10 90/100 or 9/10
10¢ 15¢ 20¢ 25¢ 30¢ 35¢ 40¢ 45¢ 50¢ 55¢ 60¢ 65¢ 70¢ 75¢ 80¢ 85¢ 90¢
2/20 3/20 4/20 5/20 6/20 7/20 8/20 9/20 10/20 11/20 12/20 13/20 14/20 15/20 16/20 17/20 18/20
10¢ 20¢ 30¢ 40¢ 50¢ 60¢ 70¢ 80¢ 90
1/10 2/10 3/10 4/10 5/10 6/10 7/10 8/10 9/10
10¢ 20¢ 25¢ 30¢ 40¢ 50¢ 60¢ 70¢ 75¢ 80¢ 90
1/4 2/4 3/4

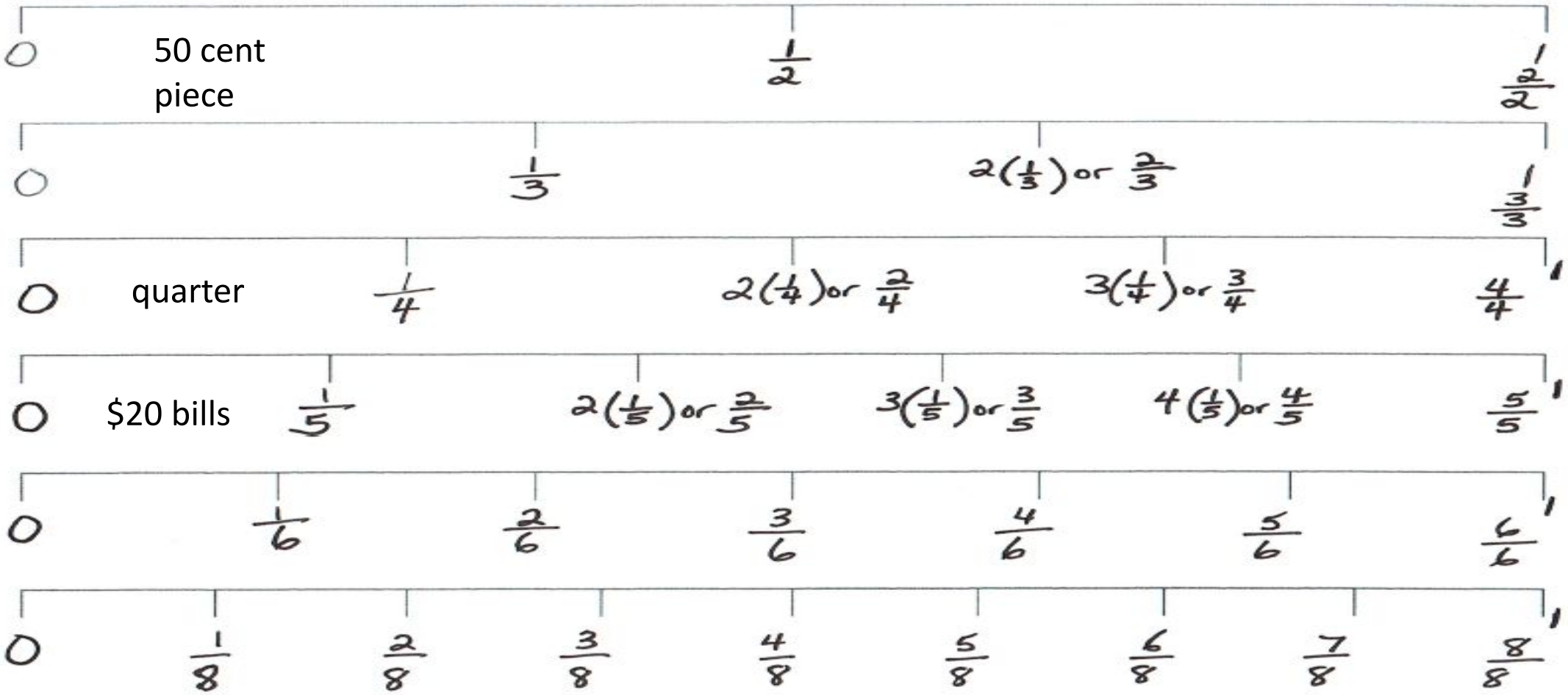

70¢
0.70
70/100 or 7/10
80¢
0.80
80/100 or 4/5
90
0.90
90/100 or 9/10
100¢
$1.00
100/100 or 1
70¢ 75¢ 80¢ 85¢ 90 95¢ 100¢
14/20 15/20 16/20 17/20 18/20 19/20 20/20
70¢ 80¢ 90 100¢
7/10 8/10 9/10 10/10
70¢ 75¢ 80¢ 90 100¢
3/4 4/4



Place 0 down the left side of each number line.
Place 1 down the right side of each number line.

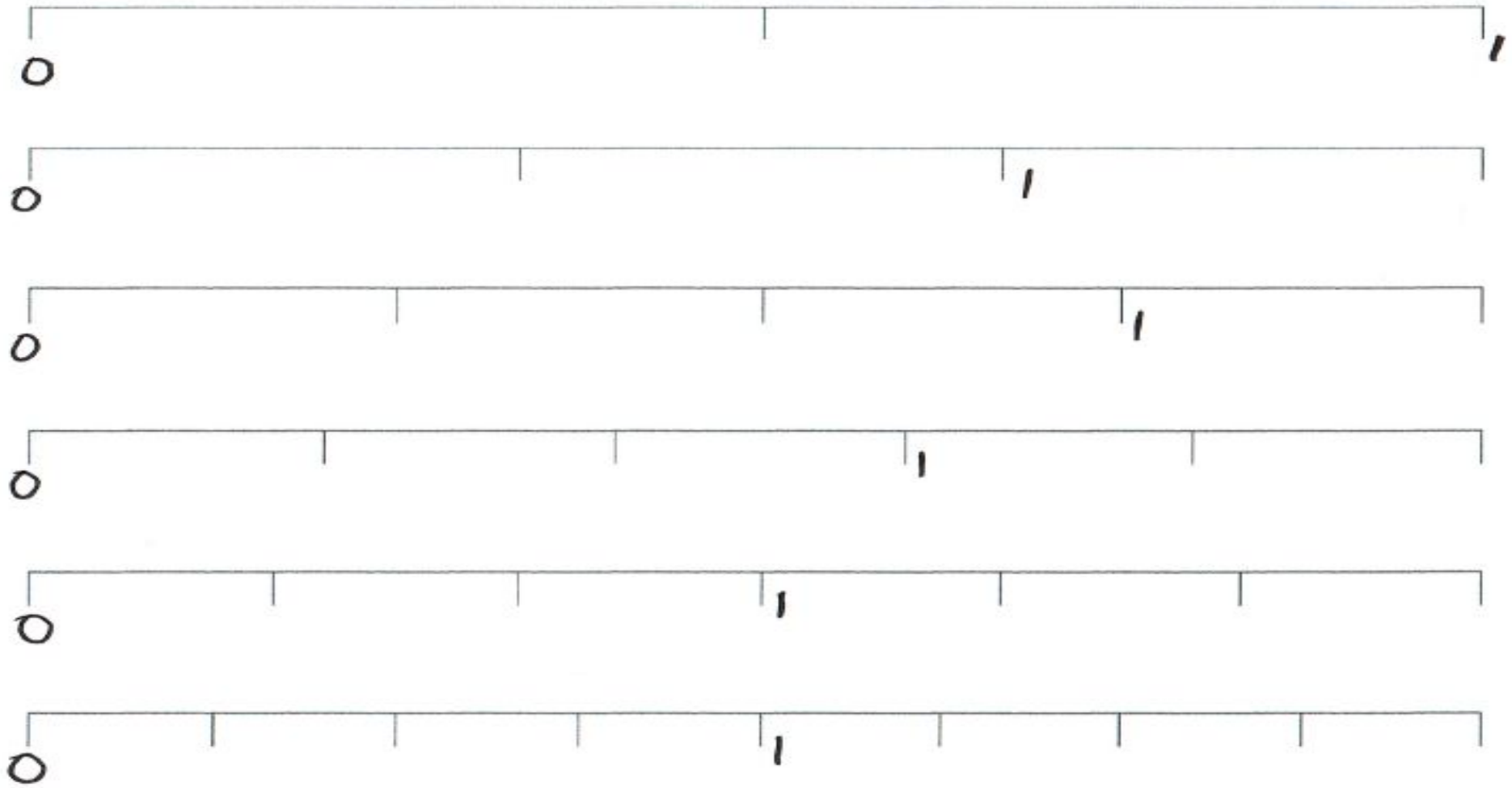
Count by each unit fraction and number each ‘tic’ mark.

Equal Jumps

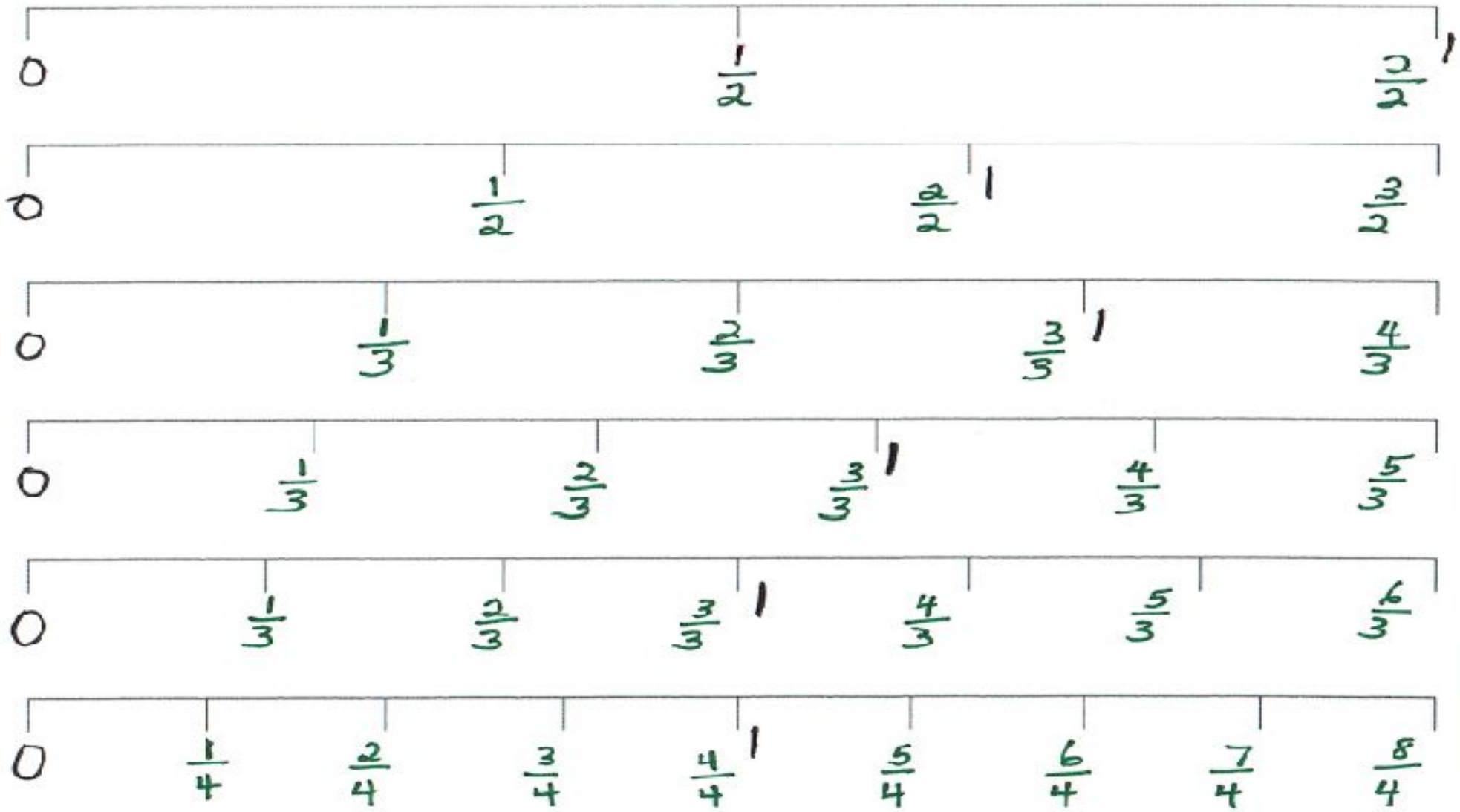


Compare

How can you recognize half?

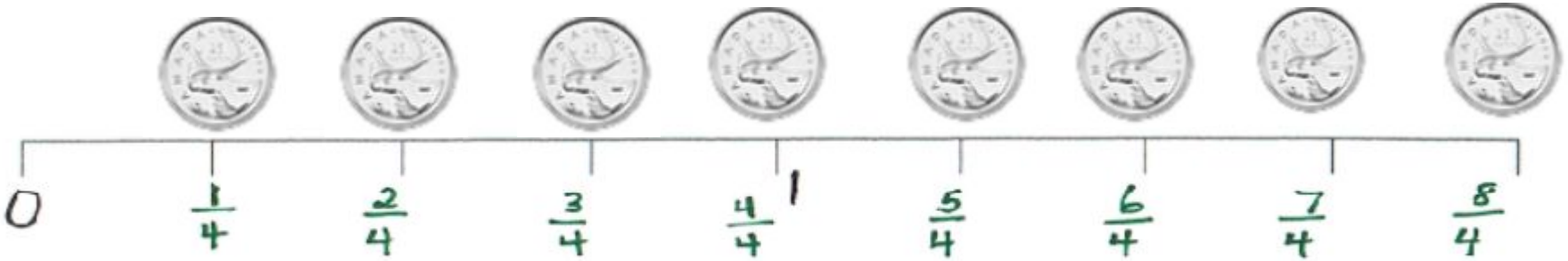


Surface
Deep
Transfer



How much is $\frac{3}{2}$?

or 1 ½ or $1.50



1 ¼
$1.25

1 ½
$1.50

1 ¾
$1.75

Math Focus
Chapter 7 Pages 220 - 253

Math Makes Sense
Unit 5 Pages 164 - 219

Model	fractions, including improper fractions and mixed numbers, using quantities, lengths, and areas.
Solve	problems involving perimeter and area of rectangles.
Determine	the factor that relates one denominator to another.
Describe	the rectangle with the least perimeter for a given area.
Recognize	two fractions with related denominators.
Add and Su	fractions.
Multiply an	up to 3-digit natural or decimal numbers by 2-digit natural numbers, using standard algorithms./up to 3-digit by 2-digit natural numbers using standard/3-digit by 1-digit natural numbers using standard algorithms.
Examine	standard algorithms for multiplication and division.
Multiply an	3-digit natural numbers by 1-digit natural numbers using standard algorithms.
Divide and	a quotient with or without a remainder.
Assess	the reasonableness of a product or quotient using estimation.
Solve	problems using multiplication and division including problems involving money./ problems requiring addition and subtraction of fractions withcommon denominators, includingimproper fractions and mixednumbers.
Explain	the standard algorithms for multiplication and division of natural numbers.
Express	a quotient with or without a remainder according to context./s improper fractions and mixed numbers symbolically./an improper fraction as a mixed number and vice versa./the composition or decomposition of fractions with comthe area of a rectangle using standard units given the lengths of its sides. mon denominators as a sum or difference./ the relationship between square centimetres, square metres, and square kilometres/
Evaluate	numerical expressions involving operations in parentheses and powers according to the order of operations.
Relate	fractions, improper fractions, and mixed numbers to their positions on the number line.
Compare	fractions, including improper fractions and mixed numbers, to benchmarks of 0, 1/2 and 1./strategies for adding or subtracting improper fractions to strategies for adding or subtracting mixed numbers./a centimetre to a square centimetre/a metre to a square metre./a square centimetre to a square metre./the perimeters of various rectangles with the same area.
Investigate	the composition and decomposition of a quantity within 1 using unit fractions.
Evaluate	numerical expressions involving addition or subtraction in parentheses according to the order of operations.
Justify	the choice of square centimetres, square metres, or square kilometres as appropriate units to express various areas.
Estimate	an area by comparing to a benchmark of a square centimetre or square metre.

Larger version of Skill Concepts found on the spreadsheet - click on "Skills link" below.

What are the Skills?

Sources:

Bruce, C., Chang, D., Flynn, T. *Foundations to Learning and Teaching Fractions: Addition and Subtraction - Literature Review.* Trent University. 2013

Bruce, C et al. Actions to Develop Fractions Understanding as contained in *Paying Attention to Mathematics Education.* http://www.edugains.ca/resourcesMath/CE/LessonsSupports/Fractions/SupportDocs/ActionstoDevelopUnderstandingFractions.pdf

__. Institute of Educational Science. *IES - Developing Effective Fractions Instruction for Kindergarten Through Grade 8.* 2010 https://www.readkong.com/tmp/developing-effective-fractions-instruction-for-kindergarten-7236374.pdf

Greenberg, D. Funny and Fabulous Fraction Stories. Scholastic Education

Ways We Use Fractions. Edugains Teacher Support: http://www.edugains.ca/resourcesDP/Resources/PlanningSupports/mathforTeachingWaysWeUseFractions.pdf

MathLinks 7. Nelson Learning Centre.

Thank you!

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