



Unpacking the New Grade 6 Math

Provincial Group

December 6, 2023



Alberta Regional Professional
Development Consortia

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



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.

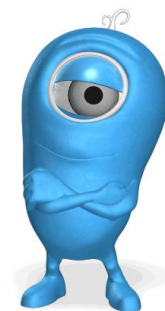




Agenda for Today!

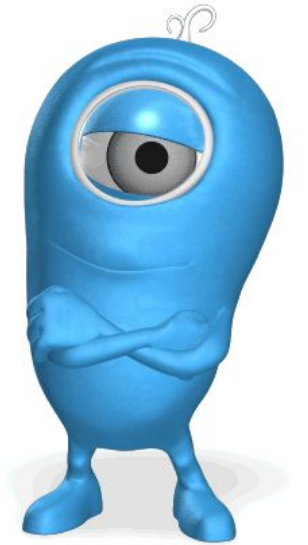
- identifying key skills and concepts in the part of our curriculum
- reviewing N6N3.1 & 3.2
- discuss strategies for 6N4
- introduce starting points for 6N5 and 6N6 Fractions which will move beyond February.
- Using money to support all outcomes
- place value understanding and how it connects with all of the outcomes
- 12x12 mastery is ongoing
- transformations

Skill	Concept/Knowledge		
Model	an equal-sharing situation in more than one way.		
Solve	problems using addition and subtraction, of fractions.		
Determine	the factor that relates one denominator to another.		
Describe	an equal-sharing situation using a fraction/ symmetrical shapes as congruent./ the horizontal and vertical components of a given translation / the line of reflection of a given reflection./ the angle and direction of a given rotation.		
Recognize	two fractions with related denominators.		
Add and Subtract	fractions.		
Multiply and Divide	up to 3-digit natural or decimal numbers by 2-digit natural numbers, using standard algorithms.		
Examine	standard algorithms for multiplication and division.		
Multiply and Divide	3-digit natural numbers by 1-digit natural numbers using standard algorithms.		
Assess	a quotient with or without a remainder.		
Solve	the reasonableness of a product or quotient using estimation.		
Explain	problems using multiplication and division including problems involving money.		
Express	the standard algorithms for multiplication and division of decimal numbers.		
Convert	a fraction as a division statement and vice versa. / two fractions with common denominators.		
Evaluate	a quotient from fraction to decimal form using division.		
Demonstrate	numerical expressions involving operations in parentheses and powers according to the order of operations.		
Create	congruence between two shapes in any orientation by superimposing using hands-on materials or digital applications.		
Relate	an image of a polygon in the Cartesian plane by translating the polygon./ an image of a polygon in the Cartesian plane by reflecting the polygon over the x-axis or y-axis./ an image of a polygon in the Cartesian plane by rotating the polygon 90° , 180° , or 270° about one of its vertices, clockwise or counter-clockwise		
	the coordinates of a polygon and its image after translation, reflection, or rotation in the Cartesian plane.		



What are the Skills?

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.

September

October

November

Number: Quantity is measured with numbers that enable counting, labelling, comparing and operating. (use money as concept/manipulative and consider FL)

6N1.1 Students investigate magnitude with positive and negative numbers.

- Symmetry of the number line extends infinitely to the left and right of zero or above and below zero.
- Direction relative to zero is indicated symbolically with a positive or negative sign.
- Magnitude with direction distinguishes between positive and negative numbers.

* Review of math facts (12 x 12) with different strategies should be ongoing

6N1.2 Students investigate magnitude with positive and negative numbers.

- Any number can be expressed as a sum in infinitely many ways. (begin with positive numbers)

6N2 Students solve problems using standard algorithms for addition and subtraction. (begin with money - review money, values to hundredths)

- Addition and subtraction of numbers in problem-solving contexts is facilitated by standard algorithms

* Review of math facts (12 x 12) with different strategies should be ongoing

6N3.1 Students analyze numbers using prime factorization and exponentiation.

- A product can be composed in multiple ways. (start with simple factor trees for example)
- The prime factors of a number provide a picture of its divisibility.

6N3.2 Students analyze numbers using prime factorization and exponentiation.

- Different representations of a product can provide new perspectives of its divisibility. (link to area diagrams)
- A power is divisible by its base

* Review of math facts (12 x 12) with different strategies should be ongoing

Geometry: Shapes are defined and related by geometric attributes.

6G1.1 Students analyze shapes through symmetry and congruence.

- Symmetry is a relationship between two shapes that can be mapped exactly onto each other through reflection or rotation. (limit to reflection)

6G1.1 Students analyze shapes through symmetry and congruence.

Symmetry is a relationship between two shapes that can be mapped exactly onto each other through reflection or rotation. (include rotation)

Coordinate Geometry: Location and movement of objects in space can be communicated using a coordinate grid.

6CG1.1 Students explain location and movement in relation to position in the Cartesian plane.

- Location can be described using the Cartesian plane.
- The Cartesian plane is the two-dimensional equivalent of the number line (may start with a quadrant 1 grid first to review plotting points)

6CG1.2 Students explain location and movement in relation to position in the Cartesian plane.

- Location can change as a result of movement in space.
- Change in location does not imply change in orientation.

Algebra: Equations express relationships between quantities.

6A1.1 Students analyze expressions and solve algebraic equations. (no exponents - review order of operations)

- The conventional order of operations can be applied to simplify or evaluate expressions (link to review of math facts 12 x 12)

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6A1.1 Students analyze expressions and solve algebraic equations. (exponents included)

- The conventional order of operations can be applied to simplify or evaluate expressions.

BDMAS - opportunity to work on 12x12 facts

BEDMAS

Work with prime Factors in Number 3.1/3.2 allows us to also evaluate using order of operations with exponents included - still can focus on 12 x 12 math facts initially

How can prime factorization and exponentiation provide new perspectives of numbers?

6N3.1 Students analyze numbers using prime factorization and exponentiation.

Knowledge	Understanding	Skills & Procedures
<p>The order in which three or more numbers are multiplied does not affect the product (associative property).</p> <p>Any composite number can be expressed as a product of smaller numbers (factorization).</p> <p>Prime factorization represents a number as a product of prime numbers.</p> <p>Any composite factor of a number can be determined from its prime factors.</p>	<p>A product can be composed in multiple ways.</p> <p>The prime factors of a number provide a picture of its divisibility.</p>	<p>Compose a product in multiple ways, including with more than two factors.</p> <p>Express the prime factorization of a composite number.</p> <p>Determine common factors for two natural numbers, using prime factorization.</p> <p>Determine divisibility of a natural number from its prime factorization.</p>

6N3.2 Students analyze numbers using prime factorization and exponentiation.

Knowledge	Understanding	Skills & Procedures
<p>Repeated multiplication of identical factors can be represented symbolically as a power (exponentiation).</p> <p>A power, A^n, includes a base, A, representing the repeated factor, and an exponent, n, indicating the number of repeated factors.</p> <p>Any repeated prime factor within a prime factorization can be expressed as a power.</p>	<p>Different representations of a product can provide new perspectives of its divisibility.</p> <p>A power is divisible by its base.</p>	<p>Identify the base and exponent in a power.</p> <p>Express the product of identical factors as a power, including within a prime factorization.</p> <p>Describe the divisibility of numbers represented in various forms.</p>

Ensure a good understanding of Primes and Composites first.

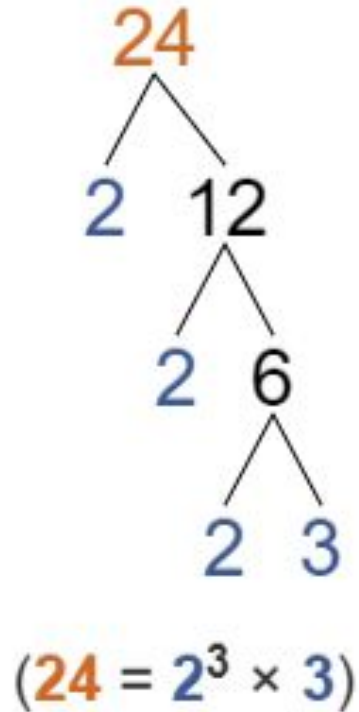
[Cuisenaire Rods](#)

[Enhancing My Pedagogical Tool Box Through Manipulatives](#)

[MathLinks 9 Chapter 3](#) Section 3.1 (Natural Number Bases only) Section 3.1 Explore, Examples 1 and 2 Pages 92 - 94, Problems Page 97 #4-9

Strategies for Finding prime Factors while ensuring the 12 x 12 math facts are reviewed!

Factorization tree of **24** is shown below.



Upside-down division of **24** is shown below.



$$(24 = 2^3 \times 3)$$

Common Factor of two numbers



Common factors are on the left side of the ladder:
2, 3, 6 (product of common primes) GCF = 6

[Factor trees](#)

[Pick the Primes](#)

[Ontario Math Grade 6 Primes](#)





[Ontario Math Grade 7 Exponents](#)

Order of Operations Questions - with and without exponents





[Dad's Worksheets](#)

[Cuisenaire Rods](#)



Cuisenaire environment

$3 \times 2 \times 4$
 $(3 \times 2) \times 4$

 6

 6

 6

 6
 $6 \times 4 = 24$


$=$
 $=$
 3
 3
 3
 3
 $4 \times 3 = 12$

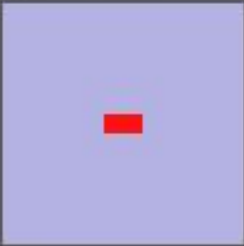
$4 \times 3 \times 2$
 $(4 \times 3) \times 2$

 3

 3

 3

 3
 $4 \times 3 = 12$
 $12 + 12 = 24$


Add rods

HomePrefabsActivitiesCollaborateHide






Rotate

Save

Load

File

on

off

Grid

on

off

Labels

+

-

Zoom

Clear rods

Resources

Math Makes Sense 6 (Pearson)

Finding Multiples Pages 55-58

Prime & Composites Pages 59 - 62

Finding Factors Pages 63-66

Factor Game Page 67

Order of operations Pages 70-73

Math Focus 6(Nelson)

identifying Factors Pages 70 -73

Identifying Multiples Pages 74-77

Prime and Composite numbers Pages 78 - 81

Factor Trees Pages 82 - 84

Order of Operations Pages 98-100

Four in a Row Game Page 101

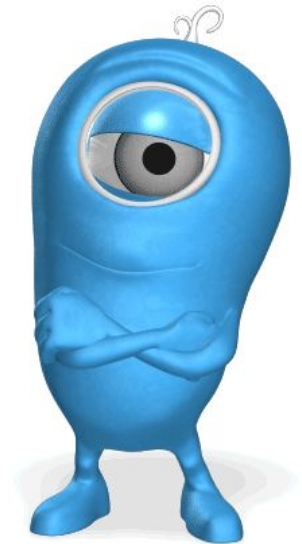
[Place Value Patterns and Decimal](#)

[Operations](#) - Resources made possible by Core Knowledge: Contains a teacher guide and student resource.

[Factors and Multiples](#) - Resources made possible by Core Knowledge: Contains a teacher guide and student resource.

[CPAR](#)

Curriculum
Planning &
Assessment
Resource



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

6N4 Students apply standard algorithms to multiplication and division of decimal and natural numbers.

- Multiplication and division of decimal numbers is facilitated by standard algorithms. (link to money and area models)

* Review of math 12 x 12 facts with different strategies should be ongoing

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6N5 Students relate fractions to quotients. (begin with unit fractions for money, move to equivalent fractions/decimals for money; stay with common denominators initially)

- Fractions represent quotients in equal-sharing situations.
- All equivalent fractions represent the same quotient

6N6 Students add and subtract fractions with denominators within 100.

- Fractions with common denominators have the same units. Any numbers with the same unit can be compared, added, or subtracted.

* Review of math 12 x 12 facts with different strategies should be ongoing.

Algebra: Equations express relationships between quantities.

6A1.2 Students analyze expressions and solve algebraic equations.

- Algebraic properties ensure equivalence of algebraic expressions.

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

This is a Base 10 Approach

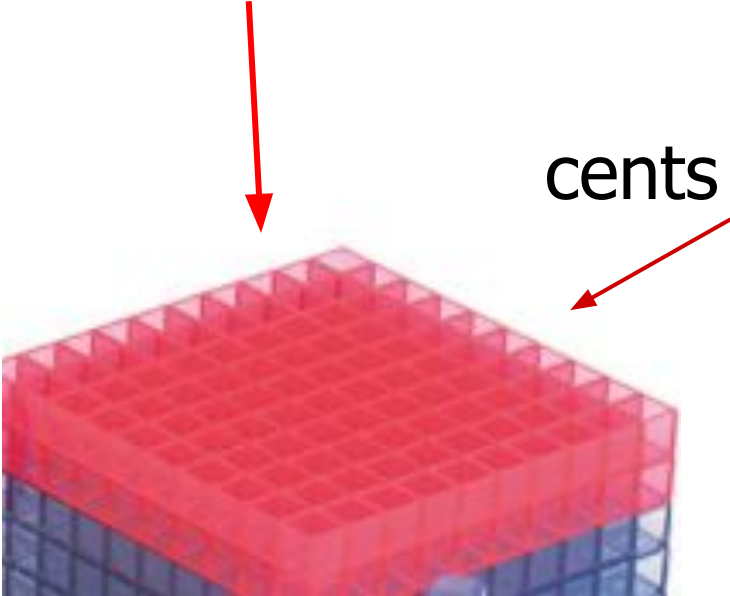
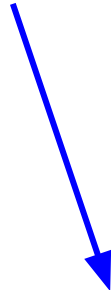


(not legal tender)

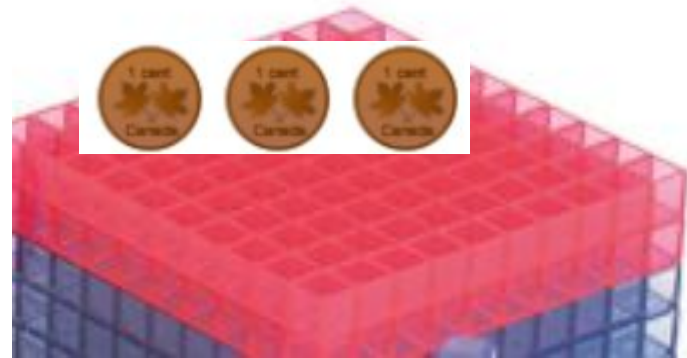


Using this approach replaces the need to rename the base 10 blocks

dollars - whole numbers



Show me 103 cents



Dollars and Cents

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



TENS

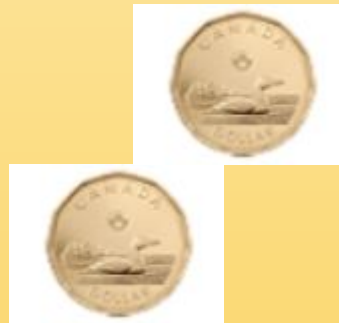


Ones



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 many 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

How can the processes of multiplication and division be applied to decimal numbers?

6N4 Students apply standard algorithms to multiplication and division of decimal and natural numbers.

Knowledge	Understanding	Skills & Procedures
<p>Standard algorithms are reliable procedures for multiplication and division of numbers, including decimal numbers.</p> <p>A quotient with a remainder can be expressed as a decimal number.</p> <p style="color: red; text-align: center;">↑ any coin changed to its decimal form would help students to make connections between fractions, division and decimals.</p>	<p>Multiplication and division of decimal numbers is facilitated by standard algorithms.</p> <p style="text-align: center;">$14.42 \div 7$</p> <p style="text-align: center;">$\\$14.42 \div 7$</p>	<p>Explain the standard algorithms for multiplication and division of decimal numbers.</p> <p>Multiply and divide up to 3-digit natural or decimal numbers by 2-digit natural numbers, using standard algorithms.</p> <p>Assess the reasonableness of a product or quotient using estimation.</p> <p>Solve problems using multiplication and division, including problems involving money.</p>

- ❖ What strategies do you offer students who struggle with math facts?
- ❖ If it's not the standard algorithm then what would they use for multiplying or dividing?

6N4 Students apply standard algorithms to multiplication and division of decimal and natural numbers.

- Multiplication and division of decimal numbers is facilitated by standard algorithms. (link to money and area models)

* Review of math 12 x 12 facts with different strategies should be ongoing

Mastery of two x one digit
38 x 8 (number facts to 12 x 12; visual representations of area and money; place value understanding; understanding of regrouping.

Same approach for two digit x two digit

Being well versed in money operations and equivalents not only helps Financial Literacy understandings but also Number operations.

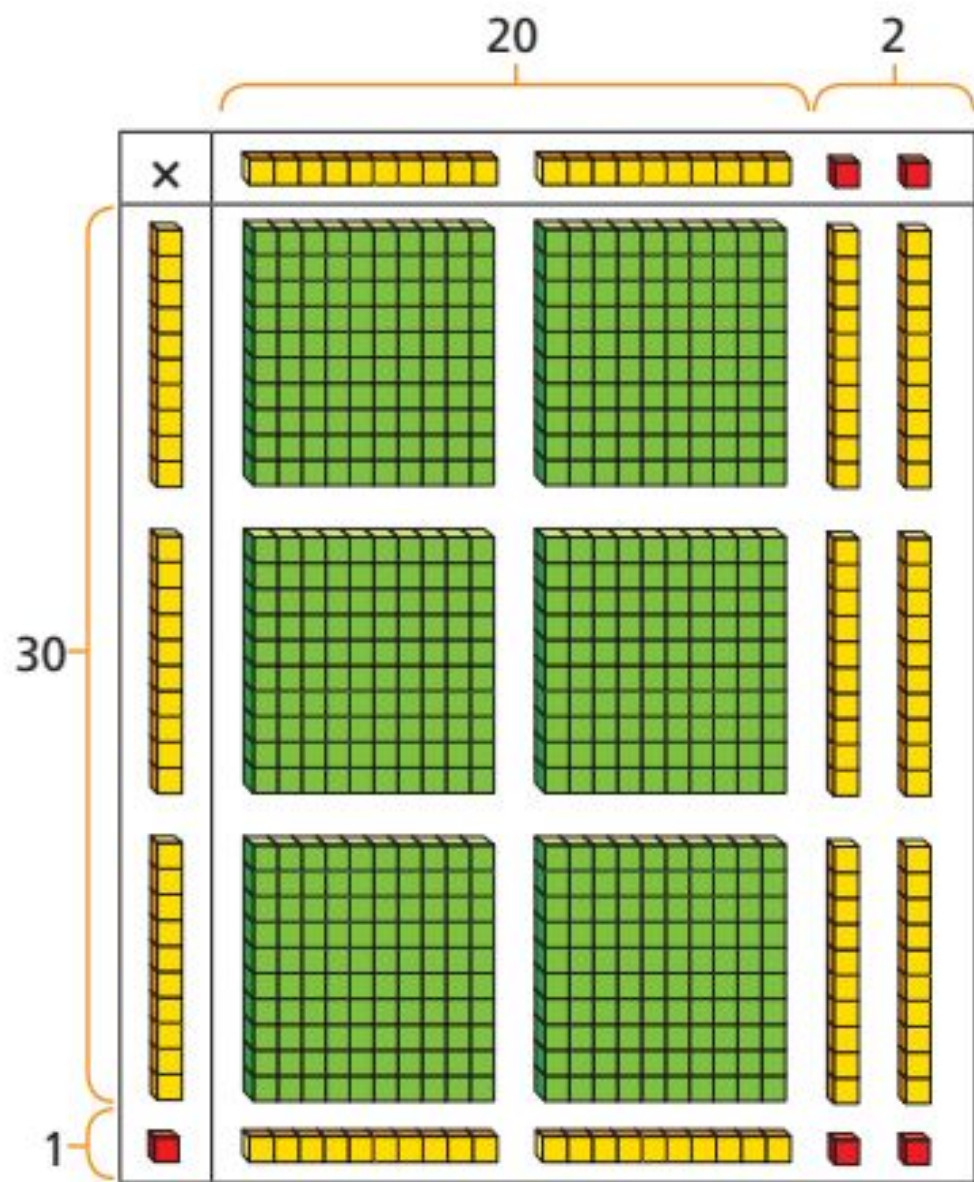
Make it REAL, Go Slow to go FAST!



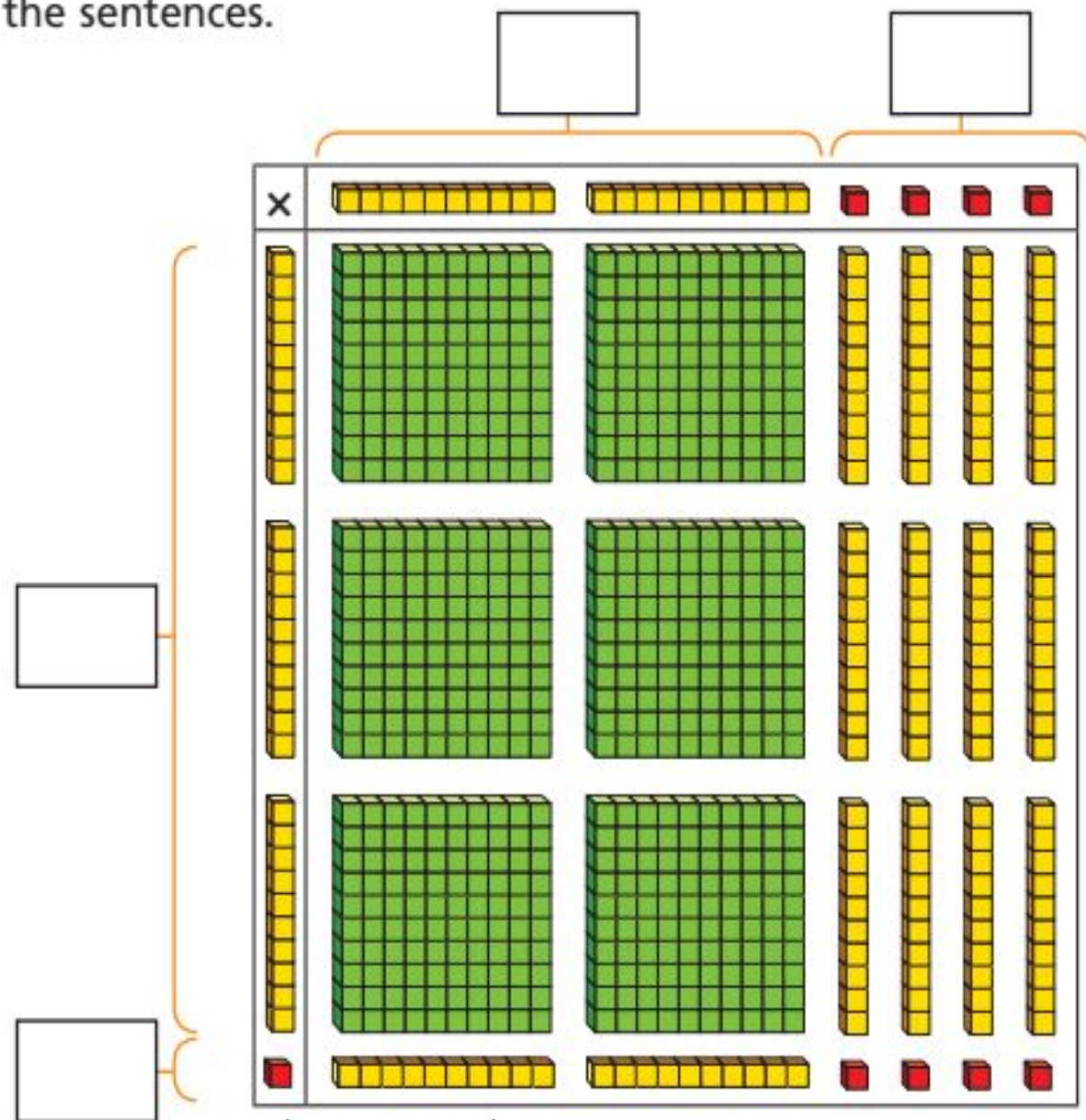
quixy.com Transformational Quotes

← Base 10 blocks

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

$$17 \times 439$$

$$439 \times 17$$

$$400 + 30 + 9$$

$$10 + 7$$

10			
+			
7			

400		
+		
30		
+		
9		

BOX Method

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

[Multiplication and Division](#)

Box Method works well for decimals as well



$$\$13.15 + \$13.15$$

13.15

13.15

26.30



$$\$13.15 \times 2$$

1

13.15

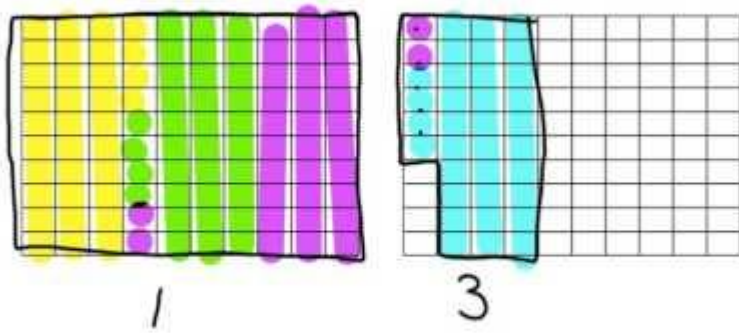
x 2

26.30





$$.34 \times 4$$



Multiplying a grid paper might also work for students

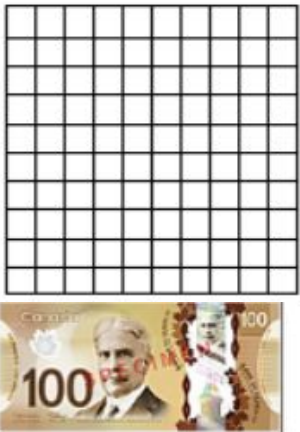


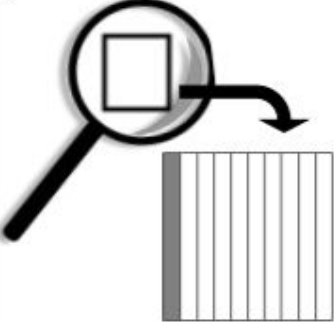
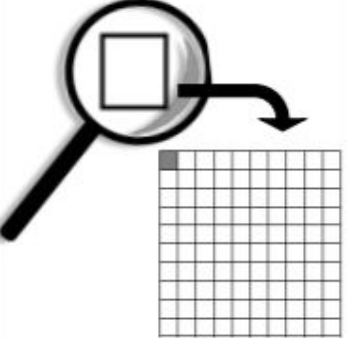
Make it REAL

$$\$4.50 \times 3$$

Each 100 grid is 100 ¢ or \$1.00

Each column of 10 squares is 10 ¢ or 0.10



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

Real World
Context



Resources

Math Makes Sense (Pearson)

Estimating Products and Quotients Pages 92-94

Multiplying Decimals by Whole Numbers Pages 95 - 98

Dividing Decimals by a Whole Number Pages 103 - 107

Math Focus (Nelson)

Estimating Products Pages 292 - 295

Multiplying Money Amounts by 11 Digit Numbers Pages 296 -299

Multiplying Decimals by 1 Digit Numbers Pages 300 - 303

Mid Chapter Review Pages 304 - 305

Estimating Quotients Pages 306 - 308

Exploring Decimal Division Pages 309 -313



Resources

Grade 4 & 5 Ontario Math - Multiplication and Division of Numbers
(Area Models and Problems)

<https://cubeforteachers.com/folders/R4TZ6ifWVheowpL3XIQ9mSQnC161UEes6riXb0Rz0X7LcXvuTmZ6IANxrDSSOBlu?q=5.B2.6&idx=posts&p=0>

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

Grade 6 Ontario Math - Multiplication by a 3 digit by a decimal (using
tools and strategies)

<https://cubeforteachers.com/folders/g71gvwtRaFIXmMh4zY1c55ee8RagyksMwvta1aluwMvWYZkY3s0VuiCtiS3Ejow8?q=6.B2.8&idx=posts&p=0>

Grade 6 Ontario Math - Multiplication by a 3 digit by a decimal
(traditional algorithm)

<https://cubeforteachers.com/folders/g71gvwtRaFIXmMh4zY1c55ee8RagyksMwvta1aluwMvWYZkY3s0VuiCtiS3Ejow8?q=6.B2.7&idx=posts&p=0>

Grade 6 Ontario Math - Divide a decimal number by a whole number.

<https://cubeforteachers.com/folders/g71gvwtRaFIXmMh4zY1c55ee8RagyksMwvta1aluwMvWYZkY3s0VuiCtiS3Ejow8?q=6.B2.11&idx=posts&p=0>

Geometry: Shapes are defined and related by geometric attributes.

6G1.2 Students analyze shapes through symmetry and congruence.

- Congruence is a relationship between two shapes of identical size and shape.
- Congruence is not dependent on orientation or location of the shapes

Coordinate Geometry: Location and movement of objects in space can be communicated using a coordinate grid.

6CG1.2 Students explain location and movement in relation to position in the Cartesian plane.

- Location can change as a result of movement in space.
- Change in location does not imply change in orientation. (review of angles)

Students are finishing their work with the four quadrants and can use their knowledge to transform shapes on the cartesian plane. They should be able to recognize that orientation does not affect congruence.

How can congruence support interpretation of symmetry?

6G1.2 Students analyze shapes through symmetry and congruence.

<p>Shapes related by symmetry are congruent to each other.</p> <p>Congruent shapes may not be related by symmetry.</p>	<p>Congruence is a relationship between two shapes of identical size and shape.</p> <p>Congruence is not dependent on orientation or location of the shapes.</p>	<p>Demonstrate congruence between two shapes in any orientation by superimposing using hands-on materials or digital applications.</p> <p>Describe symmetrical shapes as congruent.</p>
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Congruence not dependent on location and orientation.

Draw and trace with tissue paper. Also helps with rotations.

Pattern blocks on grid paper can be reflected and rotated but also translated

Rotations - 90, 180 and 270°

cc = clockwise

ccw = counter clockwise

Translation (slide)

Possible approaches to showing what the move is

If we wish to move 2 units right and 3 units up

R2, U3

$(x+2, y+3)$

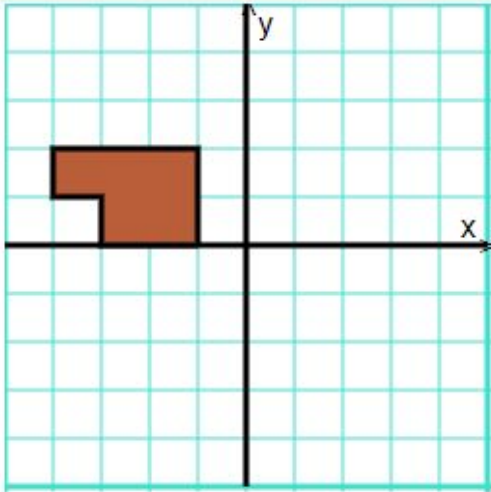
$$\begin{pmatrix} 2 \\ 3 \end{pmatrix}$$

In what ways can location be communicated?

6CG1.2 Students explain location and movement in relation to position in the Cartesian plane.

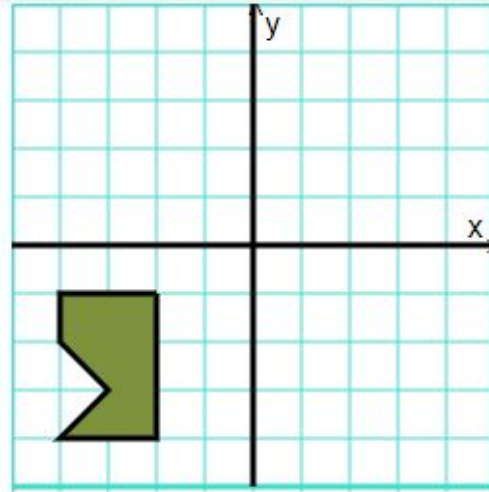
<p>A translation describes a combination of horizontal and vertical movements as a single movement.</p> <p>A reflection describes movement across a line of reflection.</p> <p>A rotation describes an amount of movement around a turn centre along a circular path in either a clockwise or counter-clockwise direction.</p>	<p>Location can change as a result of movement in space.</p> <p>Change in location does not imply change in orientation.</p>	<p>Create an image of a polygon in the Cartesian plane by translating the polygon.</p> <p>Describe the horizontal and vertical components of a given translation.</p> <p>Create an image of a polygon in the Cartesian plane by reflecting the polygon over the x-axis or y-axis.</p> <p>Describe the line of reflection of a given reflection.</p> <p>Create an image of a polygon in the Cartesian plane by rotating the polygon 90°, 180°, or 270° about one of its vertices, clockwise or counter-clockwise.</p> <p>Describe the angle and direction of a given rotation.</p> <p>Relate the coordinates of a polygon and its image after translation, reflection, or rotation.</p>
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This is level 1; Reflect a shape in a given line. Click on coordinates to draw your image.



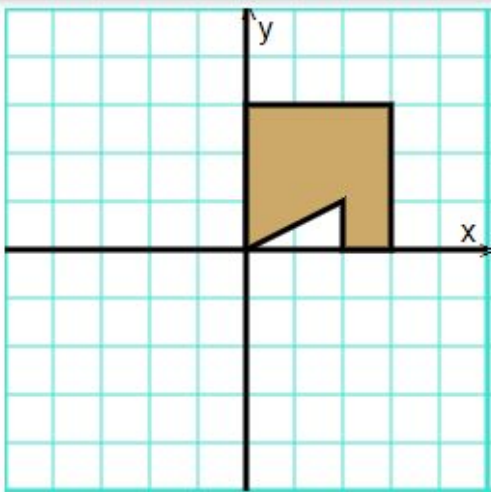
Draw the reflection of the shape in the y axis.

Show answer



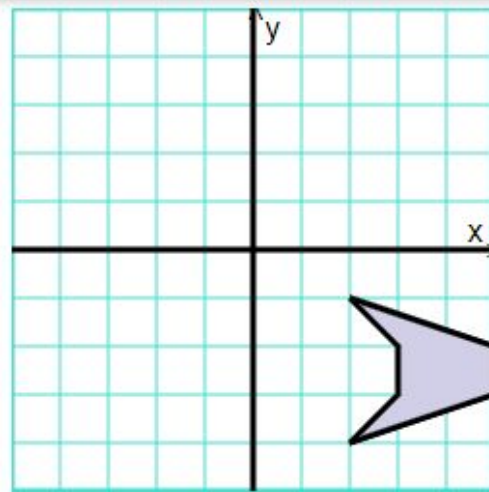
Draw the reflection of the shape in the y axis.

Show answer



Draw the reflection of the shape in the x axis.

Show answer



Draw the reflection of the shape in the x axis.

Show answer

Reflections in the x or y axis

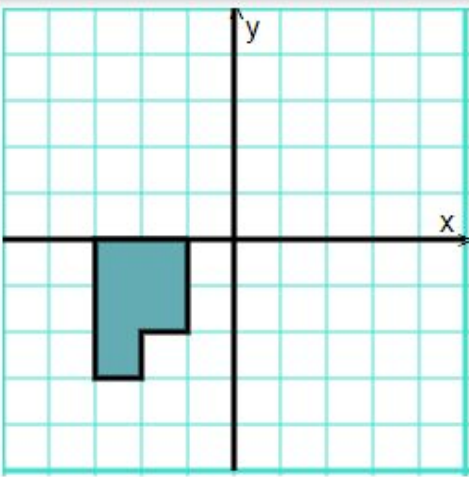
Transformations

Each click of level one creates new options

Level 2: [Translations](#) (Slide)

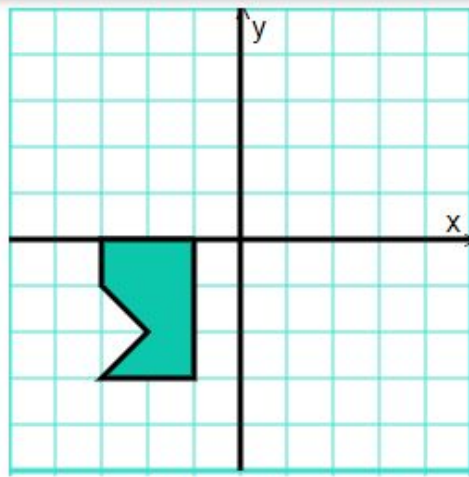
$$\begin{pmatrix} 4 \\ 1 \end{pmatrix} = (x + 4, y + 1)$$

notation above is not part of the curriculum



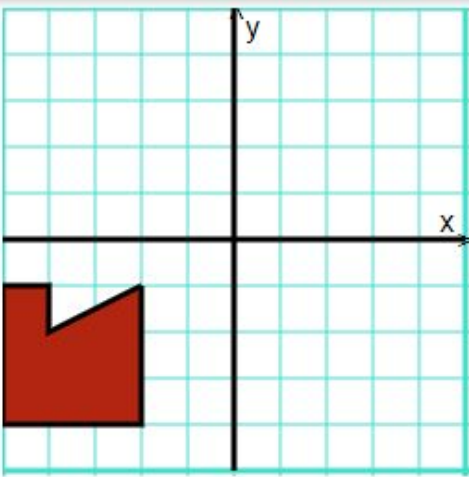
Show the image of the shape above after a translation by the vector $\begin{pmatrix} 4 \\ 1 \end{pmatrix}$

Show answer



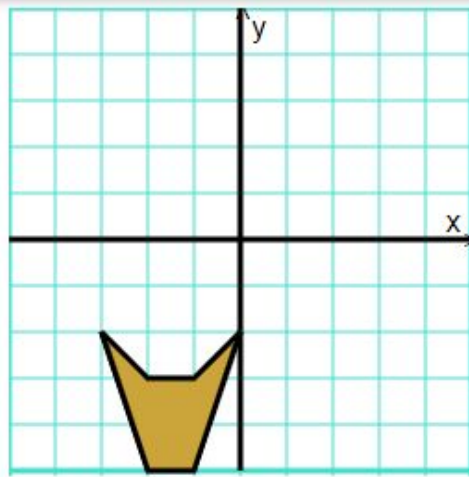
Show the image of the shape above after a translation by the vector $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$

Show answer



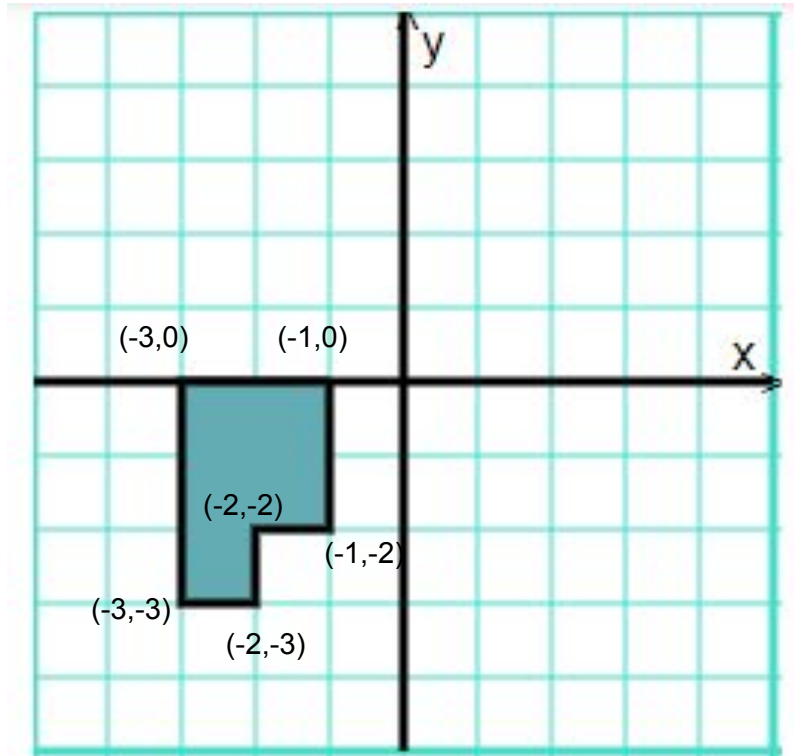
Show the image of the shape above after a translation by the vector $\begin{pmatrix} 5 \\ 2 \end{pmatrix}$

Show answer

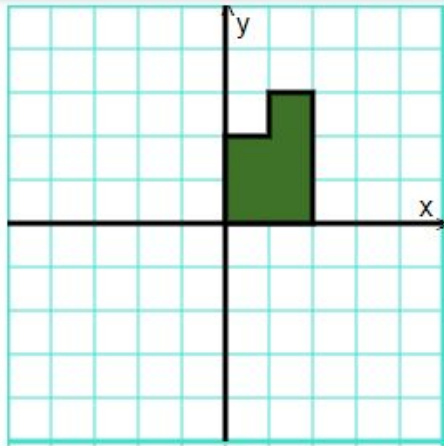


Show the image of the shape above after a translation by the vector $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$

Show answer

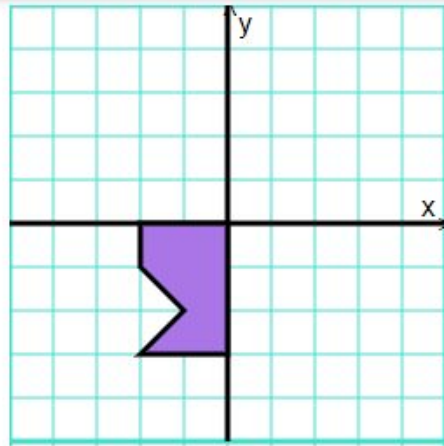


This is level 3; Rotate a shape about a given point by a given angle. Click on coordinates to draw your image.



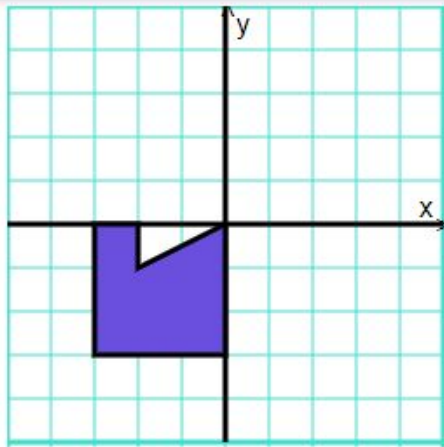
Show the image of the shape above after a rotation of 90° clockwise about the origin.

Show answer



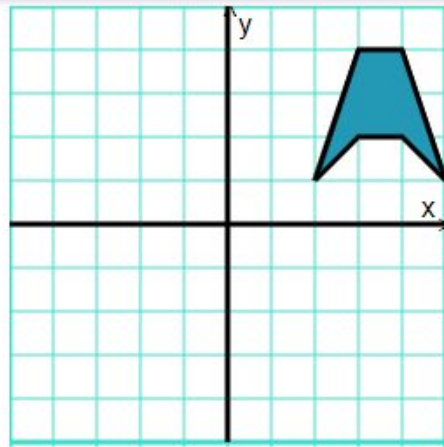
Show the image of the shape above after a rotation of 90° clockwise about the origin.

Show answer



Show the image of the shape above after a rotation of 90° clockwise about the origin.

Show answer



Show the image of the shape above after a rotation of 90° clockwise about the origin.

Show answer

Rotation around one of the vertices.

Rotations - 90° , 180° and 270°

cc = clockwise

ccw = counter clockwise

Tissue paper and one straight line is a students best friend!

Math makes Sense Grade 6 (Pearson)

Congruence in Regular Polygons Pages 219 - 223

Math Focus Grade 6 (Nelson)

Motion Geometry Chapter 5 Pages 148-173

Additional Transformation

Activities (good activities - lots of ads)

Tessellations

[Mathlinks 8](#) (McGraw-Hill/Nelson)
Chapter 12 Pages 442 - 471

Free [tessellations](#)
colouring pages to
download

Visualize and describe a
combination of two
transformations that relate
symmetrical shapes 6G1.1

freepik

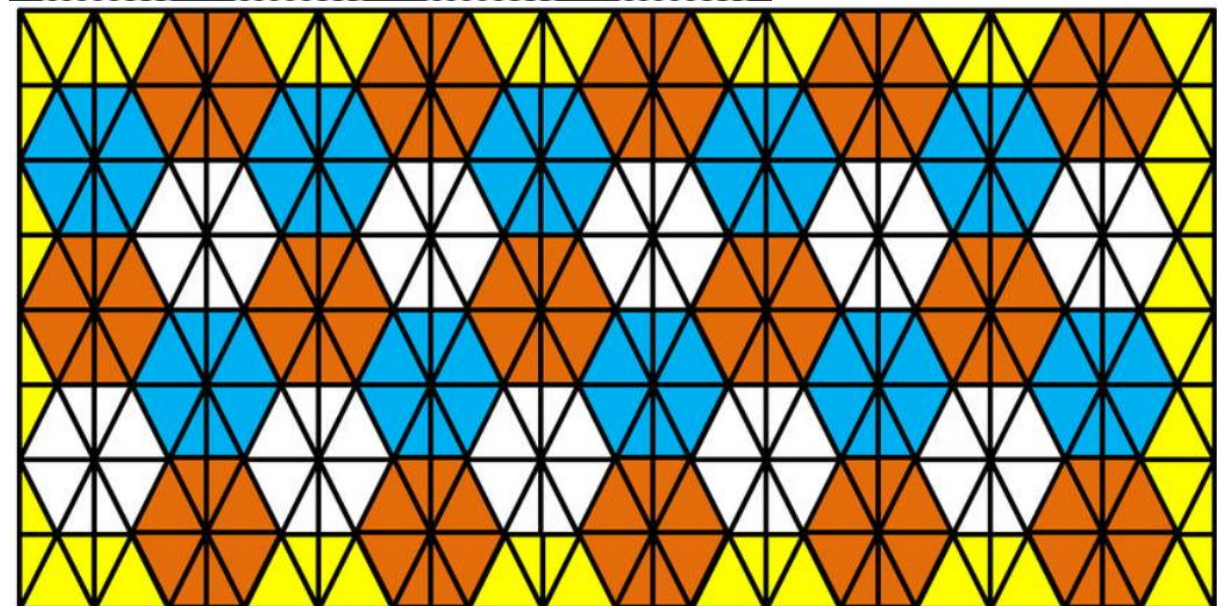
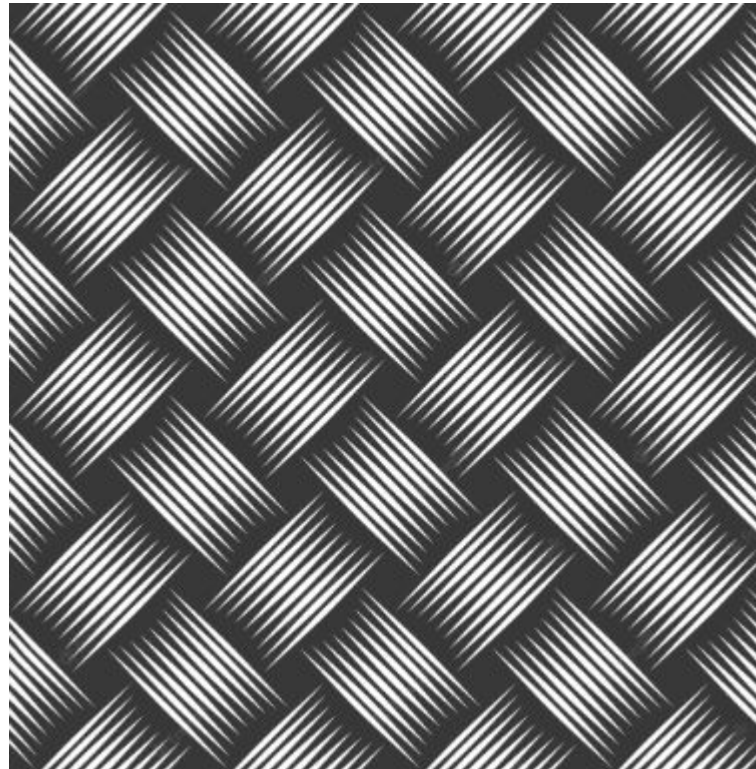


Photo courtesy of Vegreville Legion



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

An opportunity for a re-consider!

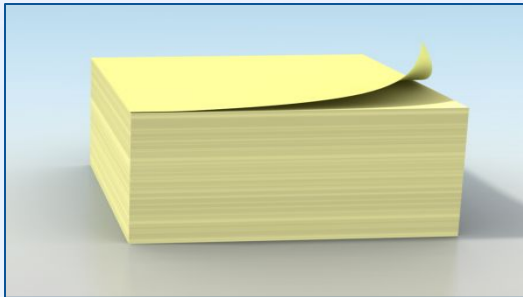
Number Line



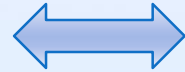
Students Internalize Concepts (near, far, more, less, before, after, one more or two more)

Students can compare numbers

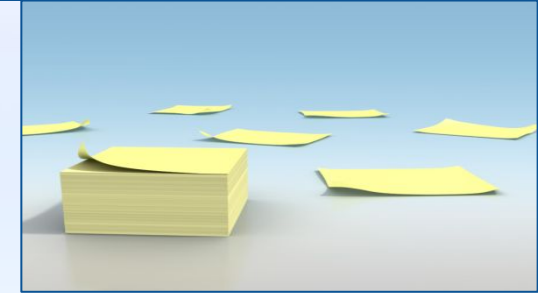
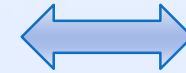
Teachers must build vocabulary throughout the activity



- 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

$1/3 > 1/2$

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

5

2

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

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

6

3

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

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

7

4

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

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

8



6N5 Students relate fractions to quotients.

Knowledge	Understanding	Skills & Procedures
<p>An equal-sharing situation can be represented by a fraction in which the numerator represents the quantity to be shared and the denominator represents the number of shares.</p> <p>Division can be used to determine an equal share.</p> <p>Division of the numerator by the denominator of a fraction provides the equivalent decimal number.</p>	<p>Fractions represent quotients in equal-sharing situations.</p> <p>All equivalent fractions represent the same quotient.</p> <p>Note: If students have done unit fraction work with money (dimes and pennies) they have learned about tenths and hundredths; familiarity with how money is represented also allows them to learn about 0.1 and 0.01</p>	<p>Model an equal-sharing situation in more than one way.</p> <p>Describe an equal-sharing situation using a fraction.</p> <p>Express a fraction as a division statement and vice versa.</p> <p>Convert a quotient from fraction to decimal form using division.</p>

Ontario Math 3 [Fair Share](#)

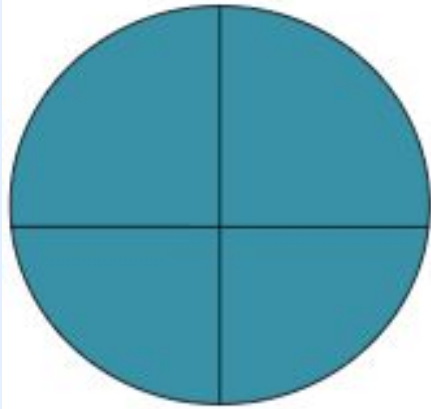
Ontario Math 4 [Representing Fractions](#)

Ontario Math 5 [Equivalent Fractions](#)

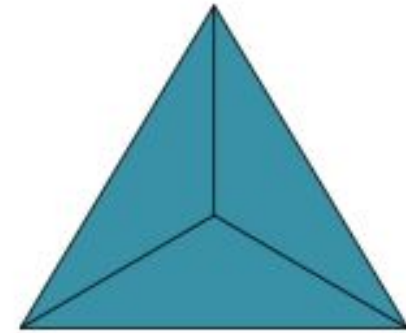
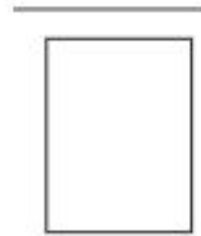
[How Far Along the Arrows](#)

Find the unit fraction for these diagrams

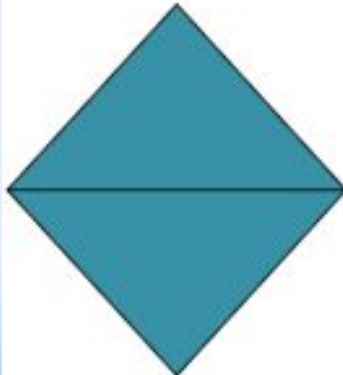
Avoid this 'count and fill in' type of worksheet soon after we talk about a unit fraction.



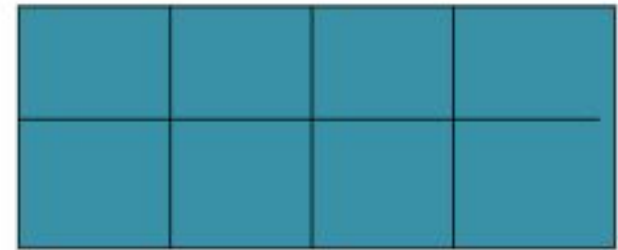
1



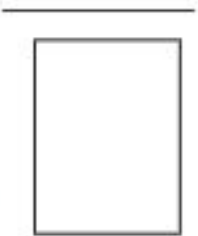
1

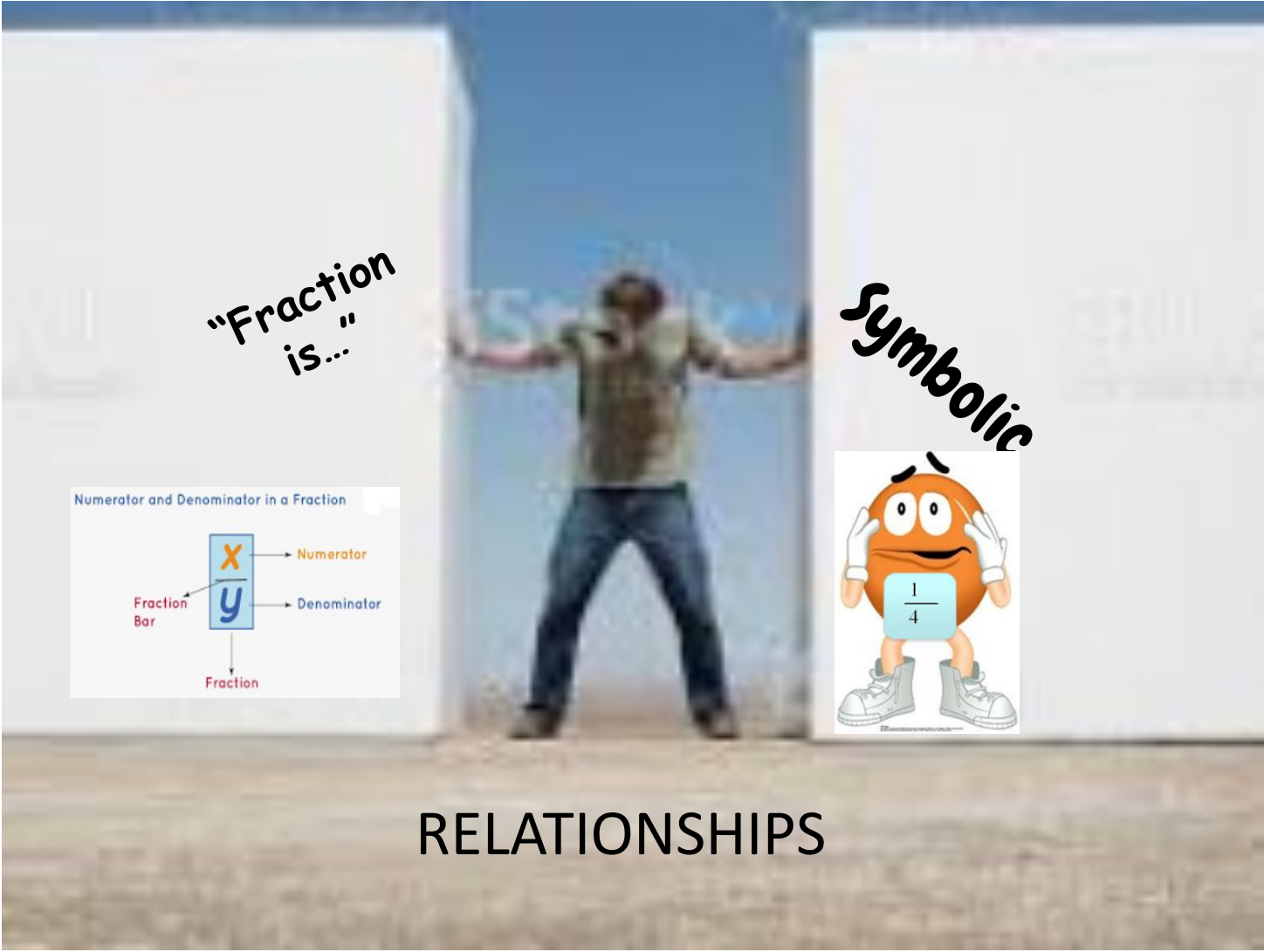


1



1





WHAT IS A FRACTION?

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

An equal-sharing situation can be represented by a fraction in which the numerator represents the quantity to be shared and the denominator represents the number of shares.
6N5





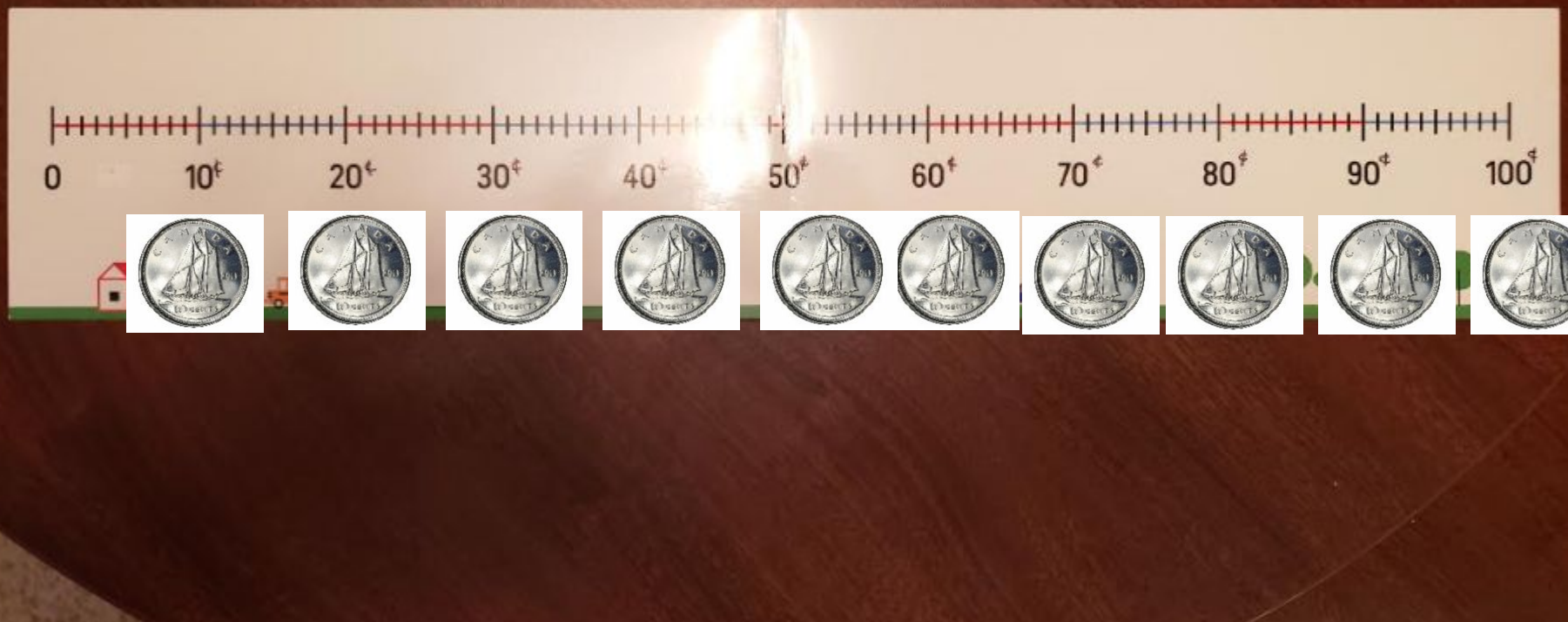
Let's move to Unit Fractions and Money



6N6 Students add and subtract fractions with denominators within 100.

Knowledge	Understanding	Skills & Procedures
<p>Addition and subtraction of fractions is facilitated by representing the fractions with common denominators.</p> <p>Denominators are related if one is a multiple of the other.</p> <p>Multiplication of one denominator by the factor that relates it to another denominator achieves common denominators.</p> <p>The product of the denominators of two fractions provides a common denominator.</p>	<p>Fractions with common denominators have the same units.</p> <p>Any numbers with the same unit can be compared, added, or subtracted.</p> <p>Common denominators revisited in Session 4</p>	<p>Recognize two fractions with related denominators.</p> <p>Determine the factor that relates one denominator to another.</p> <p>Express two fractions with common denominators.</p> <p>Add and subtract fractions.</p> <p>Solve problems involving addition and subtraction of fractions.</p>

Create the Unit Fractions Visually





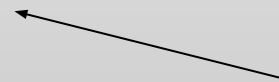
1



Numerator
(1 dime)



10



Denominator (10
dimes for 1 dollar)

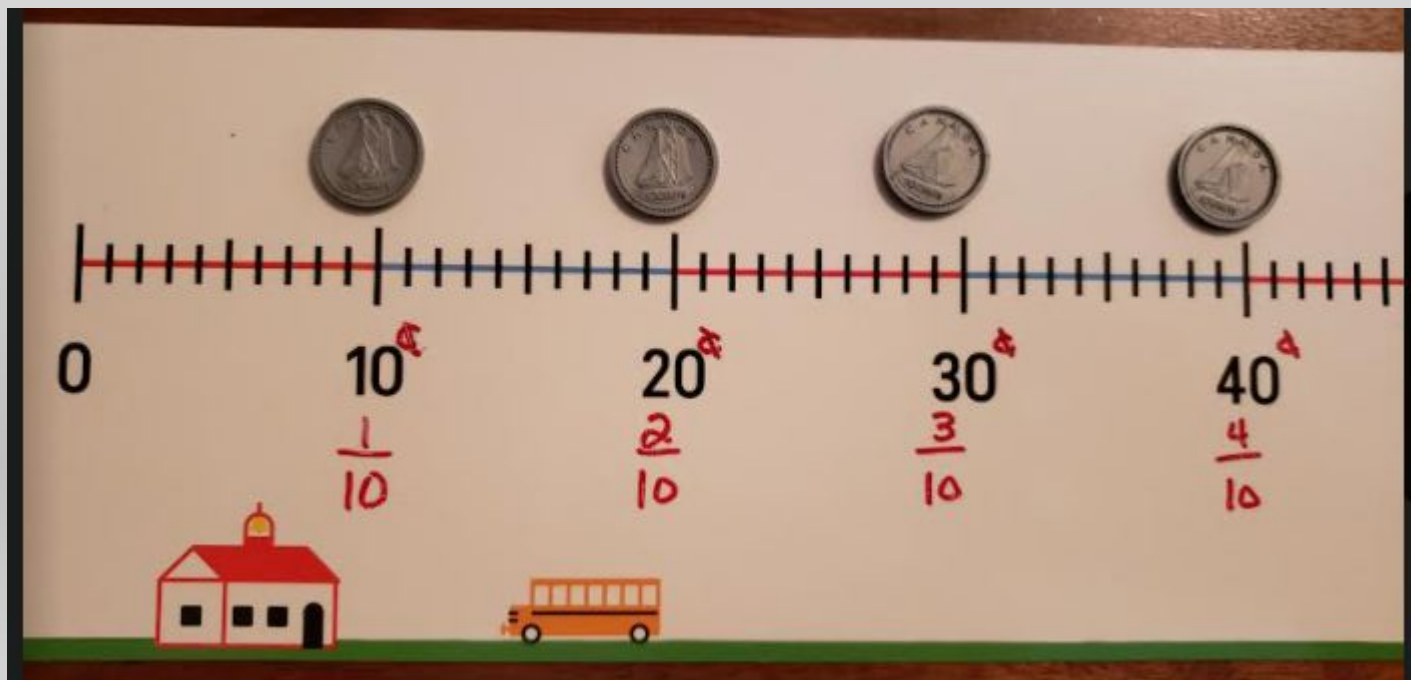


Same coin being represented



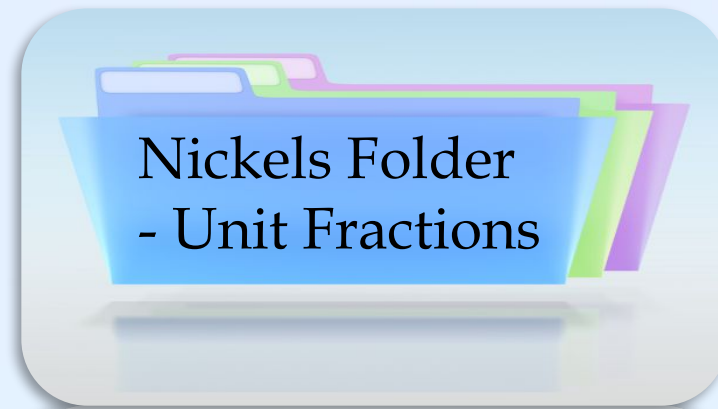
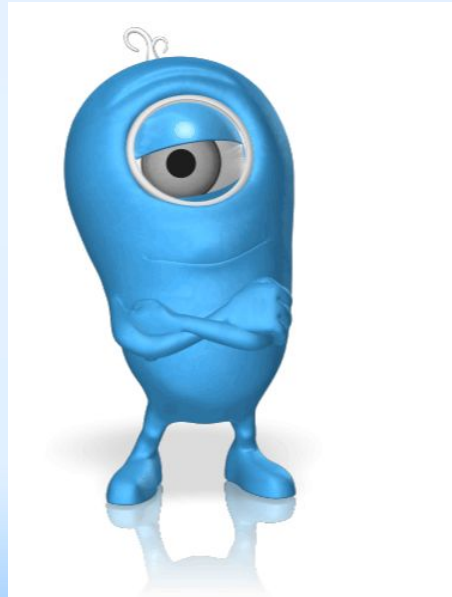
Dimes in the middle row
Label all numbers with cents





•Using more money for unit fractions

Use the top line to complete the nickels unit fractions



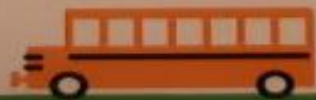
Use the bottom line to complete the quarters unit fractions

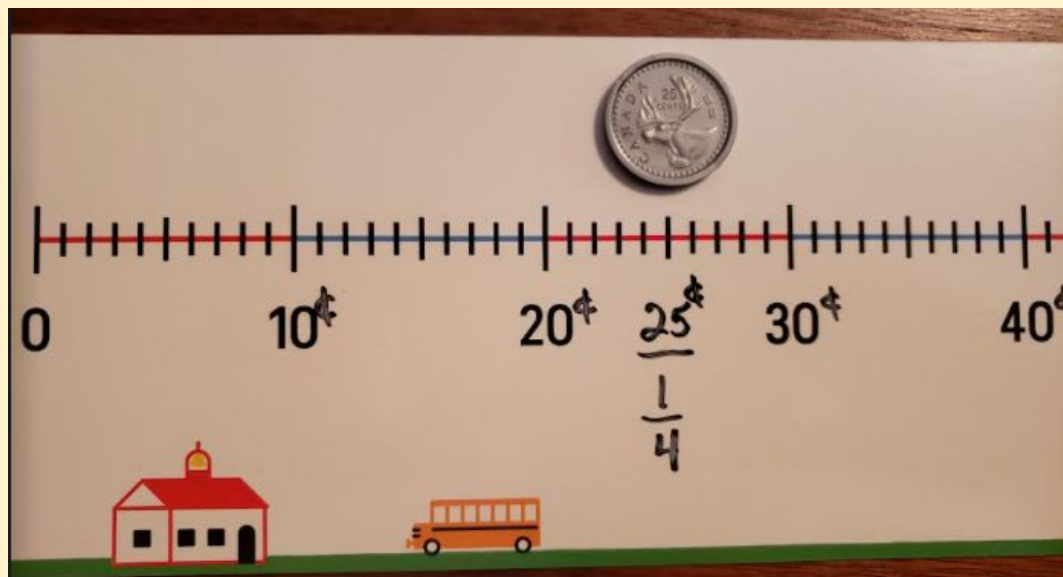


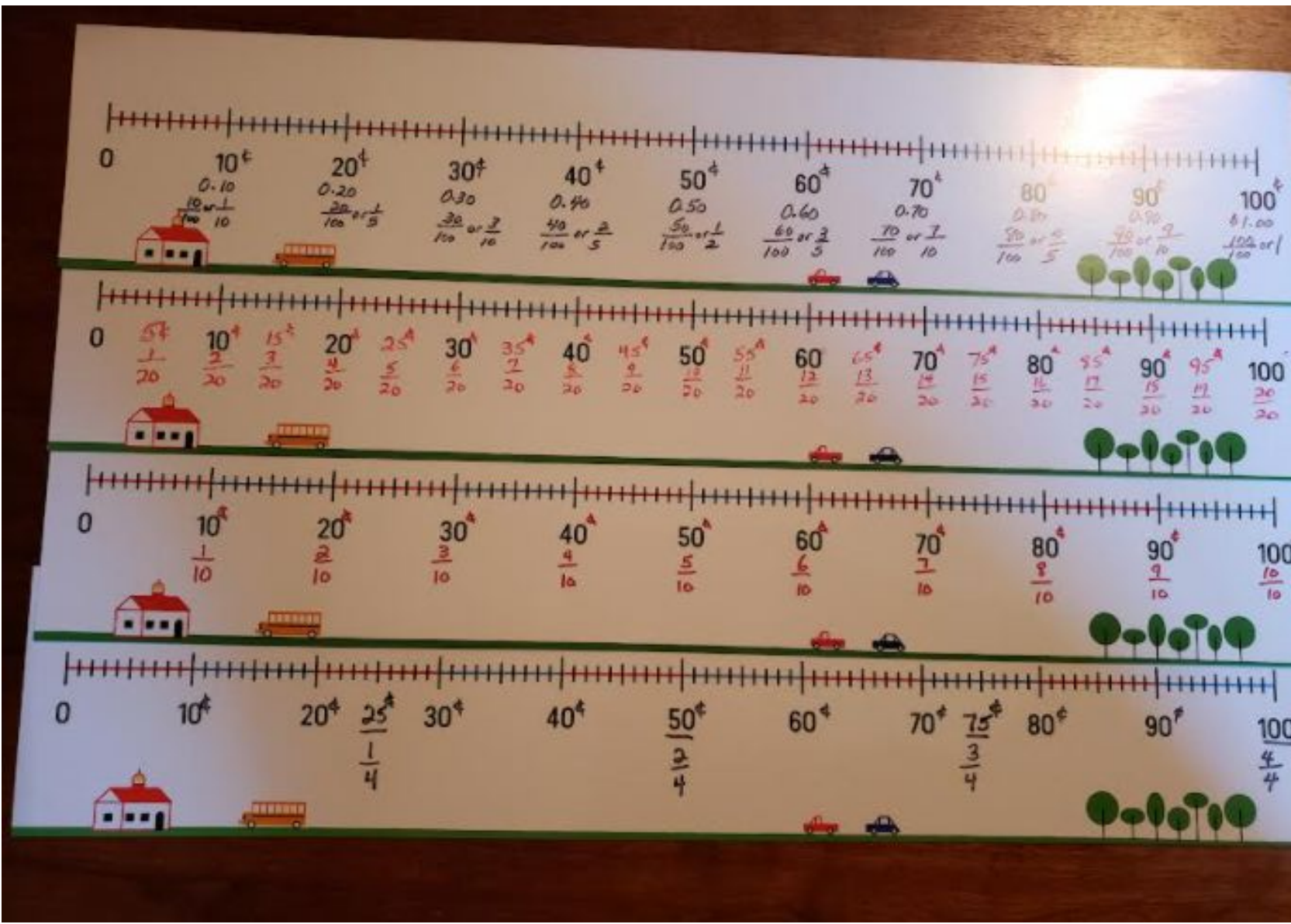
Copyright 2009

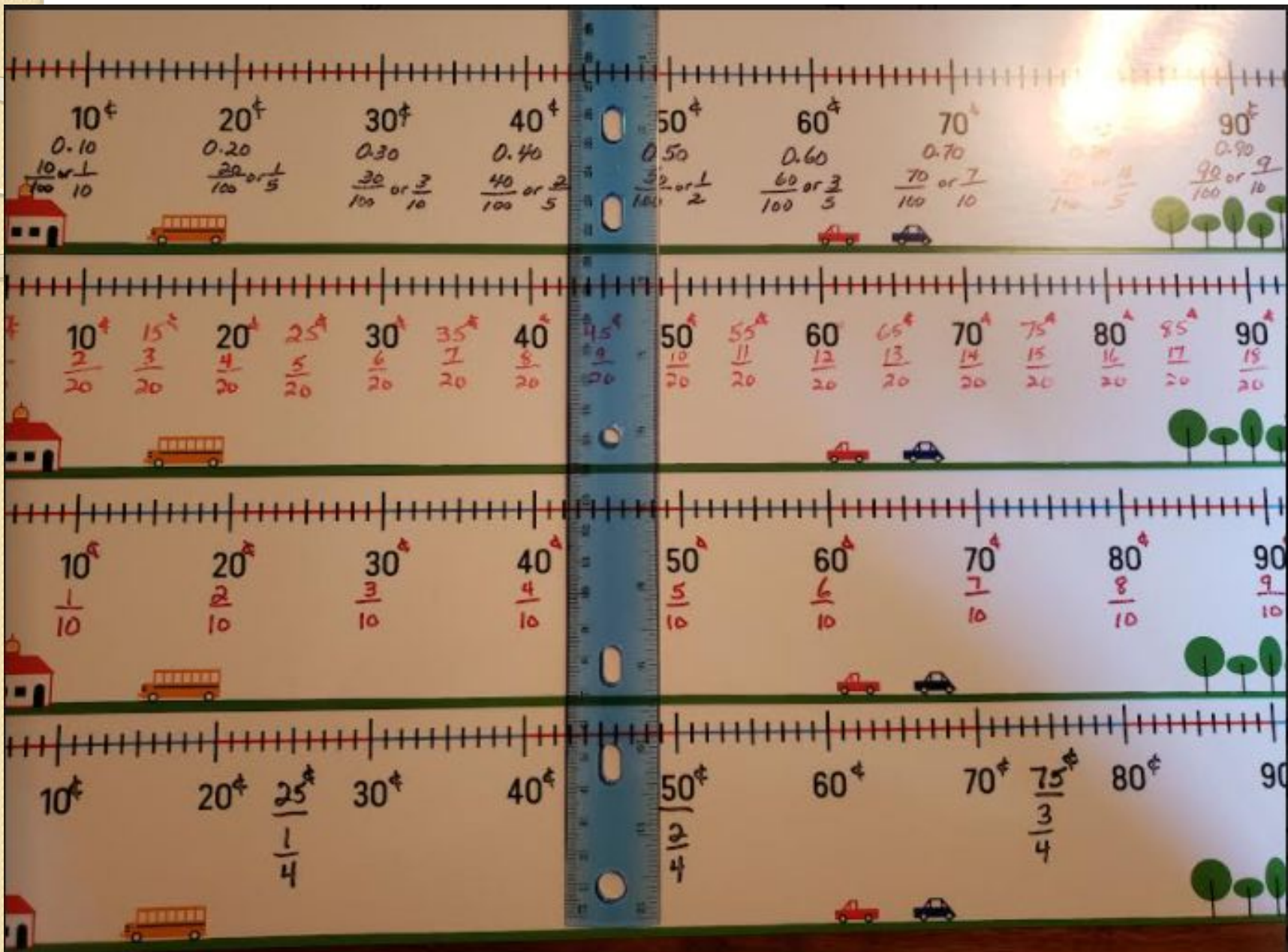


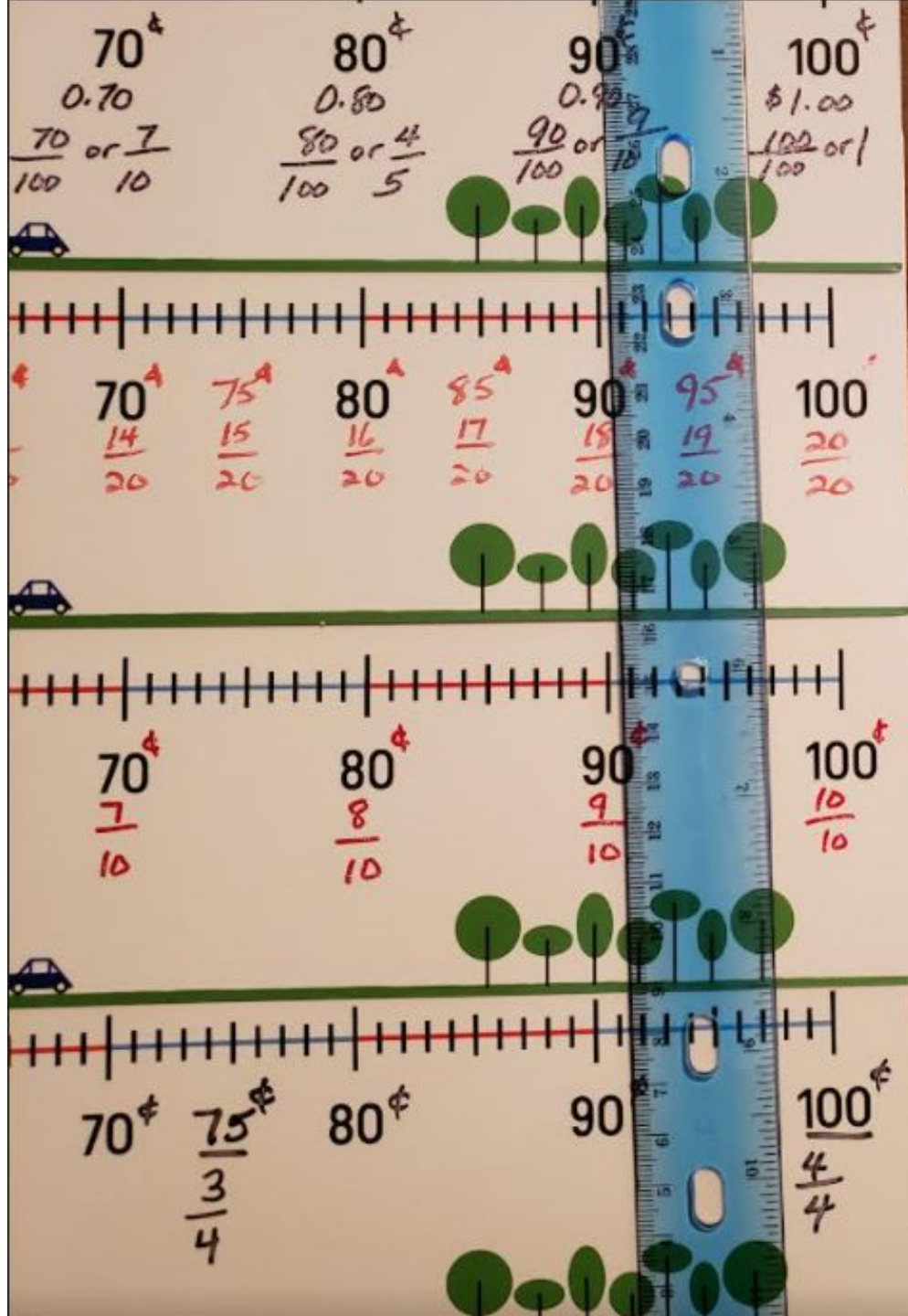
0	5¢	10¢	15¢	20¢	25¢	30¢	35¢
	$\frac{1}{20}$	$\frac{2}{20}$	$\frac{3}{20}$	$\frac{4}{20}$	$\frac{5}{20}$	$\frac{6}{20}$	$\frac{7}{20}$

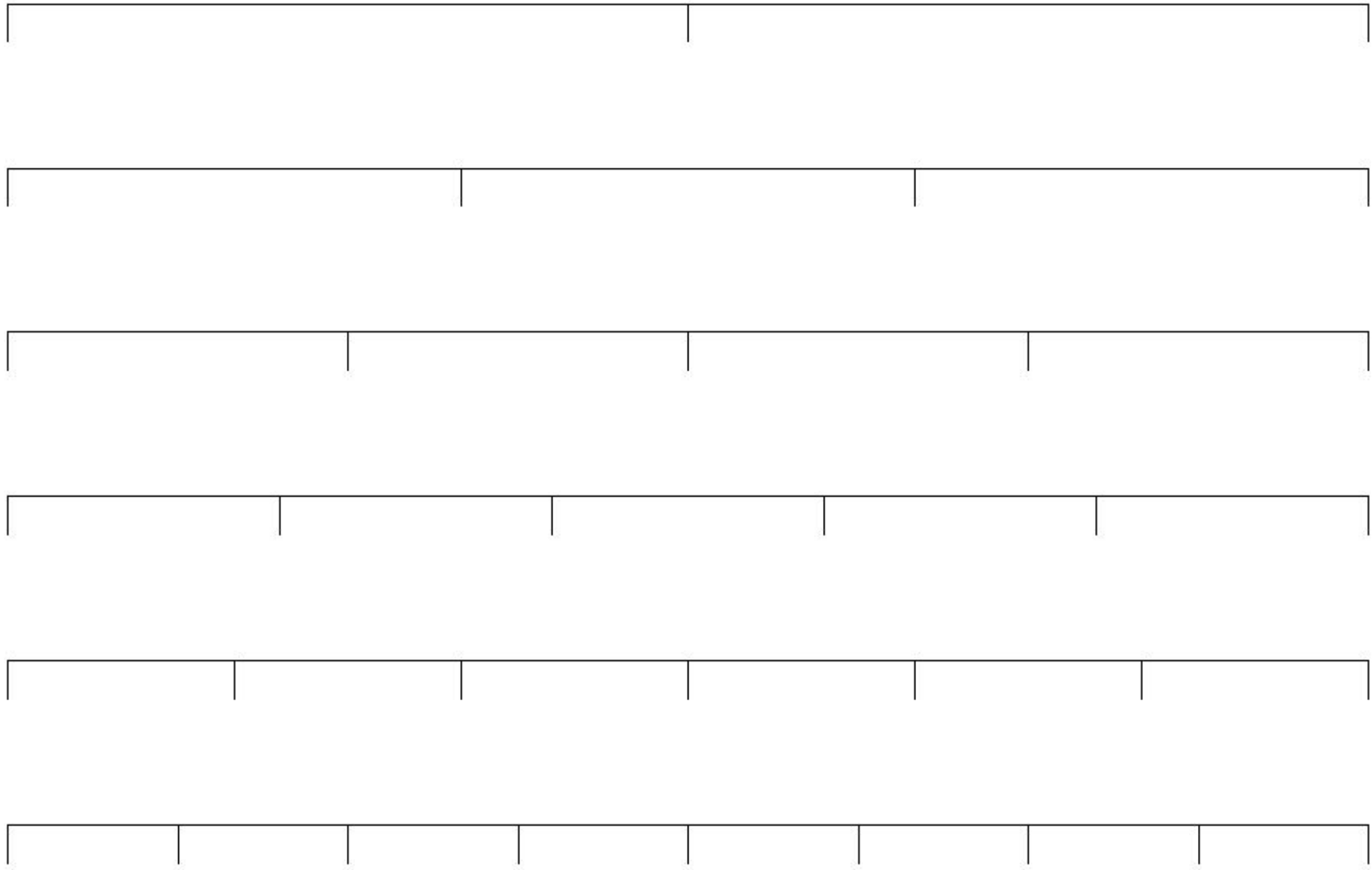




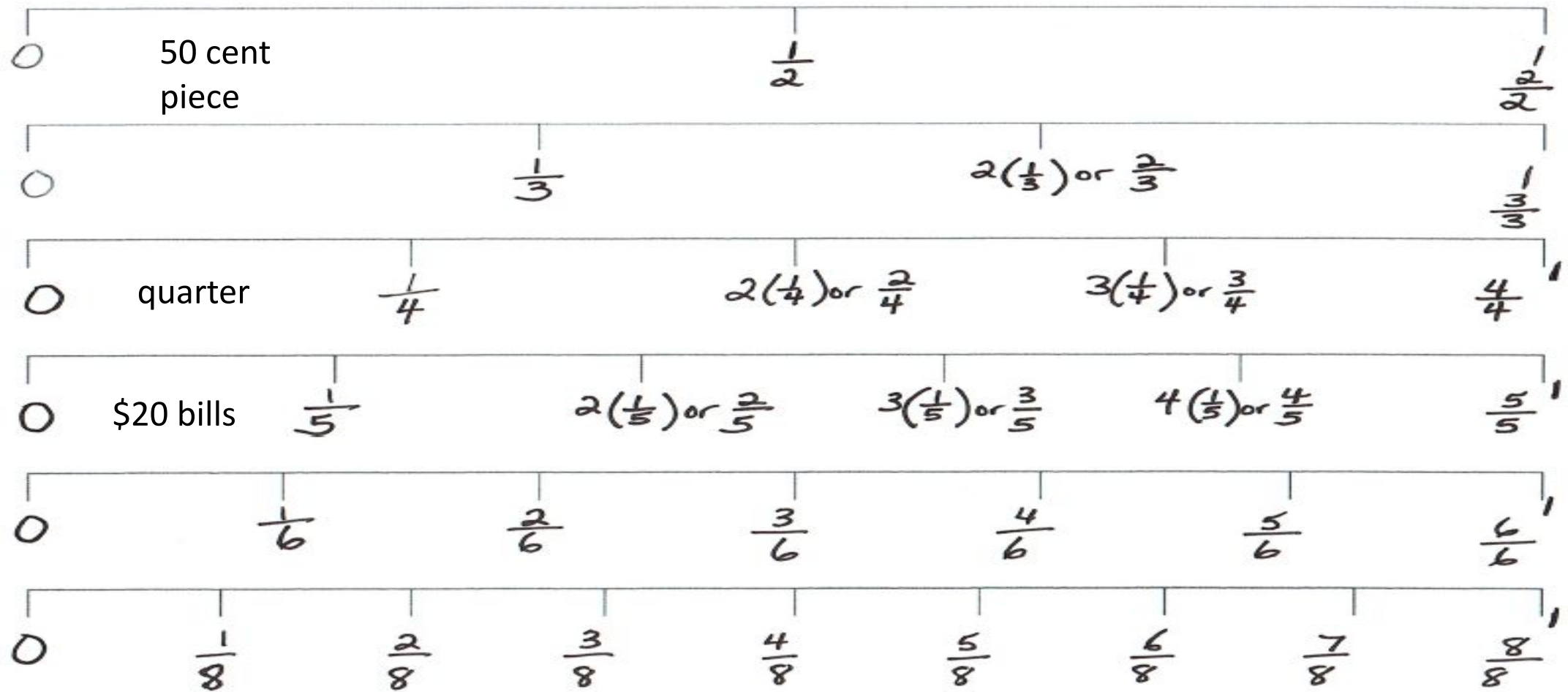






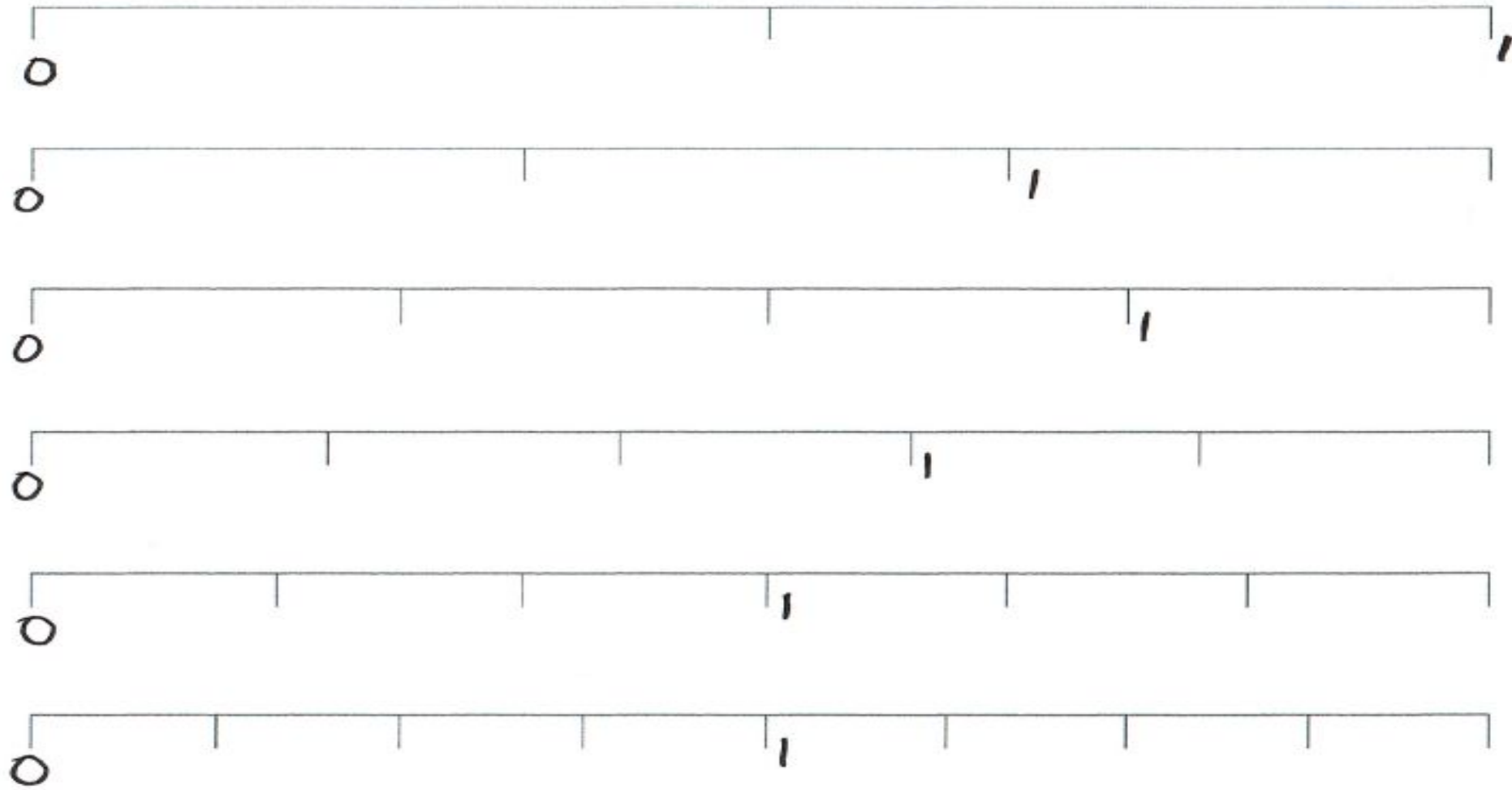


Template

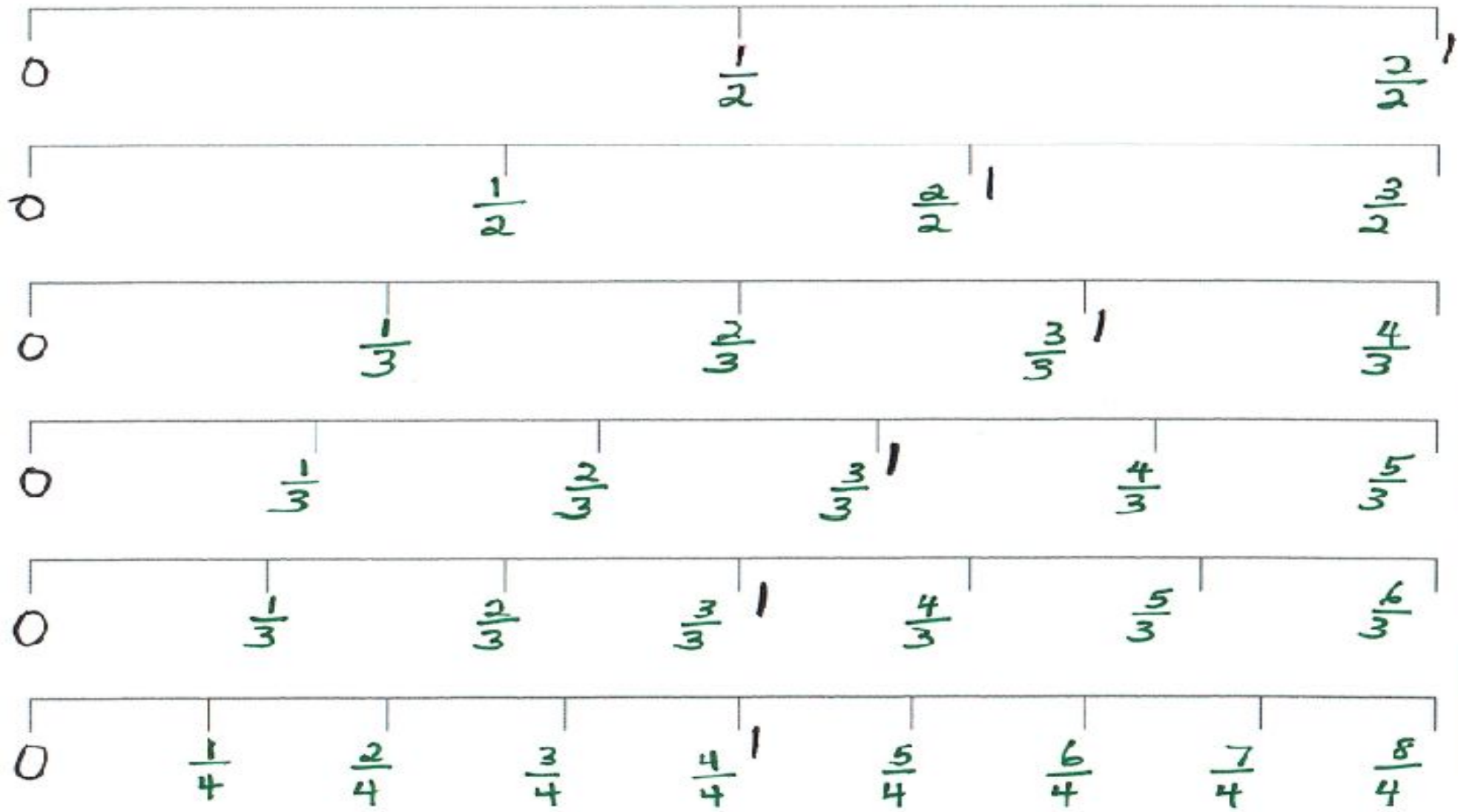


Compare

how can you recognize half?



Surface
Deep
Transfer



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

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, 8 and 9. Nelson Learning Centre.

Transum.org

Thank you!

Where are the files going to be?

Math Grade 6
ARPDC.ab.ca

