Essential Elements
Math Pacing Guide

August and September

Background

The Essential Elements Math Pacing Guide creation was inspired by realizing that there is a small amount of information found on the internet to help support educators who teach those who follow an alternate curriculum for our amazing 1% of the student population in education. I wanted to create something that could help serve as a guide, a support, an understanding of how to hold our students to high academic achievement, just like their regular education peers.

Regular education materials are abundant and come with pacing guides with how to implement the prescribed curriculum that the school choose to buy into. Within those curriculums, a good majority of publishers incorporated how to differentiate Instruction for struggling learners, for English Language Learners and/or English as a Second Language learners. However, there does not seem to be a supplementary curriculum that aligns for how to modify instruction and materials for those who follow the alternate curriculum so the 1% of students with disabilities aligned to the alternate curriculum could also learn a modified version of the same materials as their non-disabled peers.

Your partner in education,

Jeanette Nowak

Updated April 2022

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August and September Outline

Standards covered during August:

- M.EE.6.NS.1 - Compare the relationships between two unit fractions.
- M.EE.7.NS.1 - Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one.
- M.EE.7.RP.1-3 - Use a ratio to model or describe a relationship.
- M.EE.8.NS.1 - Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.

Standards covered in September:

- M.EE.6.NS.1 - Compare the relationships between two unit fractions.
- M.EE.6.NS.5-8 - Understand that positive and negative numbers are used together to describe quantities having opposite directions or values.
- M.EE.7.NS.1 - Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one.
- M.EE.7.RP.1-3 - Use a ratio to model or describe a relationship.
- M.EE.8.NS.1 - Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.

According to the Dynamic Learning Maps (DLM) website, these are the commonly tested standards that are used for the DLM assessment.

How to Access Math Instruction and Materials from Unique

1. https://www.n2y.com/unique-learning-system/
2. Log in using the provided username and password you received
3. Click on Unique Learning System
4. Click on the three lines →
5. Select Monthly Lessons/Unit Lessons
6. Select Math
    a. When selecting materials, select PDF icon to save and print
7. Select Math Story Problems – Addition
    a. Fractions
8. Select Math Story Problems – Subtraction
    a. Fractions
    b. Positive and negative numbers
9. Select Algebra
    a. Ratios

Understanding Differentiated Levels In Unique

- Level 3 Learners – can read text and can participate more independently in the lesson (Independent)
- Level 2 Learners- require pictorial support and require mild to moderate support to participate in the lesson (Supported)
- Level 1 Learners- require extensive supports to participate in the lesson (Participatory).

Measuring Success by the Essential Elements Standards

Students who take DLM assessments are instructed and assessed on *Essential Elements*. Essential Elements are grade-specific expectations about what students with the most significant cognitive disabilities should know and be able to do. The Essential Elements relate to college and career readiness standards for students in the general population.

August Math Pacing Guide
6th Grade

M.EE.6.NS.1 - Compare the relationships between two unit fractions.

Learning Goal:

- Level 2-3 – I will compare two unit fractions.
- Level 1 – I will count fractional objects.

Essential Questions:

- How can I represent these fractions?
- What is the relationship between the two fractions?
- Are they equivalent?
- Which fraction is larger/smaller?

Vocabulary:

- **numerator** - the top number in a fraction, which shows the number of parts of the whole taken.
- **denominator** - the bottom number in a fraction, which shows the number of parts the whole has been divided into.
- **equal** - alike in size, value or amount to something else.
- **fraction** - a representation of a division of a number; a part of a whole.
- **half** - either of two equal parts of something.
- **quarter** - one of four equal parts into which something is divided.
- **whole number** - a positive integer or zero. 1, 15, 30 and 894 are examples.

DYNAMIC® LEARNING MAPS

Mini-Map for M.EE.6.NS.1
Subject: Mathematics
The Number System (NS)
Grade: 6

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.6.NS.1 Compare the relationships between two unit fractions.	**M.6.NS.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions (e.g., by using visual fraction models and equations to represent the problem).

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of a unit by recognizing a group of countable objects. Communicate understanding of "wholeness" by recognizing an object that has all the parts joined together. Recognize parts of an object and the whole object.	Recognize two glasses with an equal amount of liquid. Divide familiar shapes, such as circles, squares, and/or rectangles, into two or more equal parts.	Recognize a fraction as a number expressed as a quotient of two integers in the form *a*/*b*, with *b* not equal to zero. Demonstrate understanding of a unit fraction (e.g., 1/4) as the quantity formed by one part when a whole is partitioned into *n* (e.g., 4) equal parts. Recognize the number above the fraction bar as the numerator and the number below the fraction bar as the denominator.	Communicate understanding that when a whole is divided into more parts, each part is smaller than when that same whole is divided into fewer parts (e.g., 1/5 is smaller than 1/2 because in 1/5 the whole is divided into five equal parts and in 1/2 the same whole is divided into two equal parts).	Communicate understanding that the numerator represents a number of equal parts and the denominator represents how many equal parts make up the whole. Compare fractions (i.e., which fraction is greater than and which is less than) using manipulatives. Add fractions with common denominators (e.g., 2/5 + 1/5 = 3/5), and decompose fractions into sums of unit fractions with the same denominator

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[1] https://dynamiclearningmaps.org/essential-elements/math

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
				(e.g., 3/7 = 1/7 + 1/7 + 1/7).

[2]

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

In order to compare unit fractions, students need to gain experience with parts and wholes. This concept can literally be taught in every area of mathmatics (i.e., sets, number sense, counting, operations, patterns, measurement, data analysis, geometry, and algebra). Educators can start by having students work with sets, taking whole sets and breaking them into parts based on attributes. When counting, label what has been counted (e.g., two balls, one marker, three CDs), count the items, label it again, and encourage students to use numerals to label and count the separate sets. Use tools like the ten-frame to point out whole and parts (e.g., a row of 5 dots and a row of 4 dots are parts or subsets of 9).

How is the Distal Precursor related to the Target?

As students begin to develop the understanding of sets and numbers, educators will highlight the differences between sets on the basis of overall area or discrete number using the words more, less, and equal. Provide students with multiple opportunities to count and compare a wide variety of sets with an increasing number of items, label the set (e.g., eight ball, 12 bears, 15 blocks), and move items in and out of the sets, labeling and counting them again (e.g., "You just said this set has 11 cubes; if I take two cubes, how many will you have?").

Being able to partition shapes requires a student to recognize a unit and recognize when basic objects are in whole and part forms. Work on this understanding by giving students an opportunity to observe, feel, or otherwise interact with objects and shapes in their whole and part forms. The general goal is to explore the differences between whole units or objects and parts of units or objects. As students explore shapes, label them and describe them as whole or part. Have students build (construct) and take apart (deconstruct) shapes.

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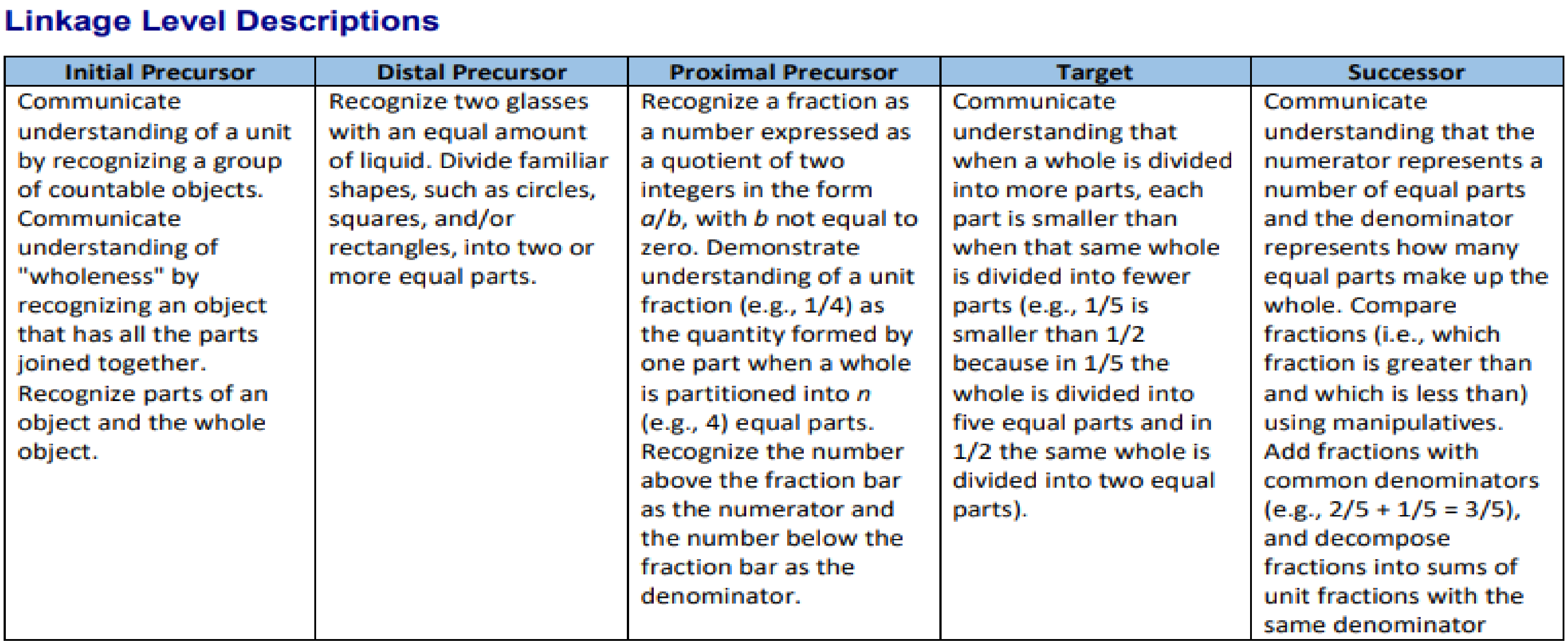
[2] https://dynamiclearningmaps.org/essential-elements/math

[3]



Linkage Level Descriptions

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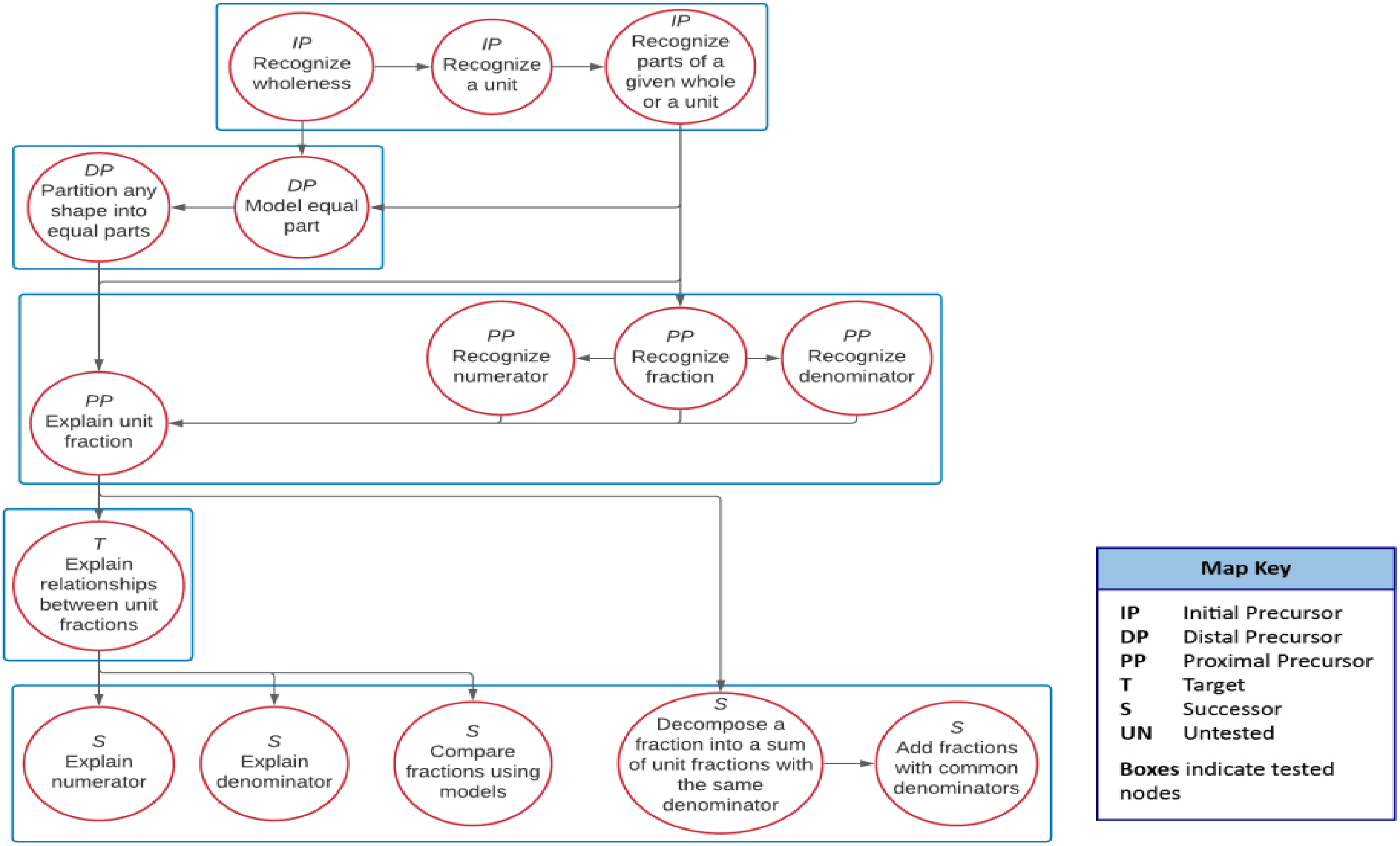
[3] https://dynamiclearningmaps.org/essential-elements/math

M.EE.6.NS.1 Compare the relationships between two unit fractions.



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[4] https://dynamiclearningmaps.org/essential-elements/math

Rubric of Student Success

M.EE.6.NS.1 - Compare the relationships between two unit fractions.

Level 3 Students will… Successor and Target Students will…	Level 2 Students will… Proximal Precursor and Distal Precursor Students will…	Level 1 Students will… Initial Precursor Students will…
Level 3 Apply use of fractional representations of 1/4, 1/3, 1/2, 1/8, and 1/10 in the context of real-world problems and scenarios.	**Level 2** Recognize appropriate use of 1/2, 1/3, and 1/4, in the context of real-world problems and scenarios.	**Level 1** Select fractional units as part of a real-world problem or scenario.
Successor • Explain numerator • Explain denominator • Compare fractions using models • Decompose a fraction into a sum of unit fractions with the same denominator • Add fractions with common denominators **Target** • Explain relationships between unit fractions	**Proximal Precursor** • Recognize numerator • Recognize fraction • Recognize denominator • Explain unit fraction **Distal Precursor** • Partition any shape into equal parts • Model equal part	**Initial Precursor** • Recognize wholeness • Recognize a unit • Recognize parts of a given whole or a unit

Instructional Ideas

M.EE.6.NS.1 - Compare the relationships between two unit fractions.

Fractions can mean different things and be modeled in different ways:

- Part of a set
- Part of a region
- As a measure

The big idea is a fractional part is equal to, less than, or greater than one whole.

- Introduce the activity by asking essential questions about fractions.
- Display a circle or other shape with one line cutting it in half and ask, “How many parts in this shape cut into?” Discuss students’ responses.
- Introduce and discuss the numerator and denominator and what each one represents.
- Tell students it is their job to recognize fractions.
- Identify that a unit fraction is one part of a whole.
- Indicate that the more parts a whole is divided into, the smaller the parts will be.
- Use partitioning and iterations to represent the unit fractions.
- Compare two unit fractions.
- Use appropriate manipulatives to establish understanding of concepts.
- Included worksheets are examples of what to look for when finding additional materials that best fits your students needs.

Additional Instructional Ideas

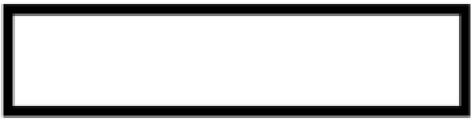
- Go to website for additional instructional resources, materials, and activities for lessons:
    - https://www.msnowakhomeroom.com/2a-fraction-unit.html

¾ Fractions

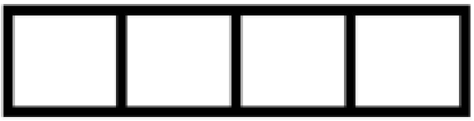
A **fraction** is a part of a whole.

$\frac{\text{part}}{\text{whole}} \rightarrow \frac{3}{4} \leftarrow \frac{\text{numerator}}{\text{denominator}}$

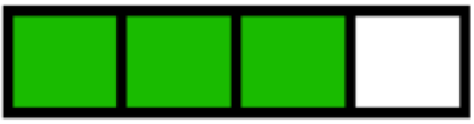
1 whole rectangle



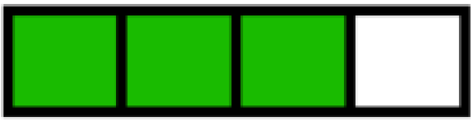
divided into 4 equal parts



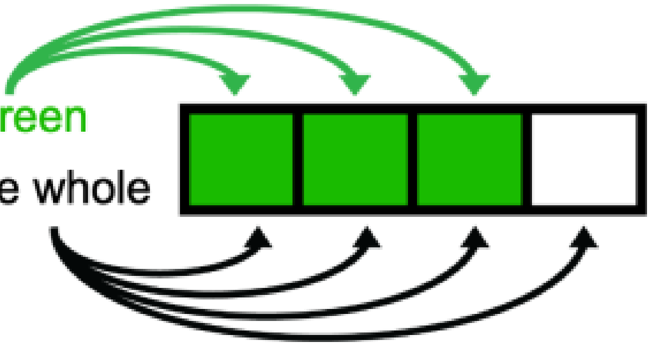
3 of the **4** equal parts shaded green



$\frac{3}{4}$ are shaded green
(three-fourths)

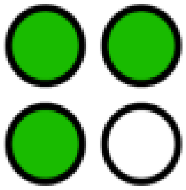


$\frac{3}{4}$ 3 ← number of parts shaded green
4 ← total number of parts in the whole



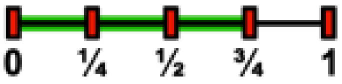
Other Ways to Represent a Fraction

$\frac{3}{4}$



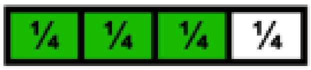
Part of a Set

$\frac{3}{4}$



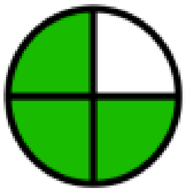
Number Line

$\frac{3}{4}$



Fraction Bar

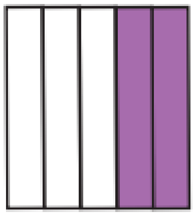
$\frac{3}{4}$



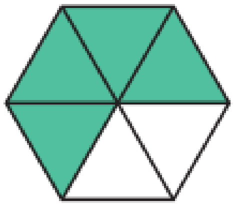
Fraction Circle

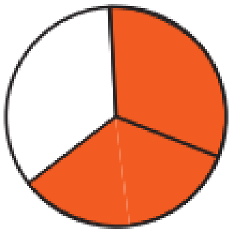
FRACTION PRACTICE

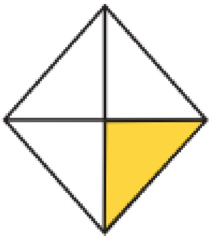
Write the fraction the shaded parts of each shape represent.

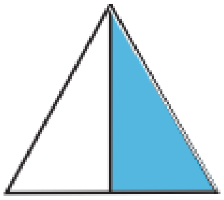


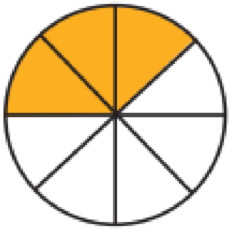
$\frac{2}{5}$

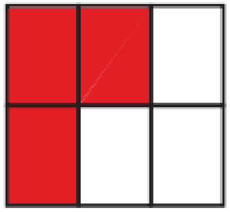


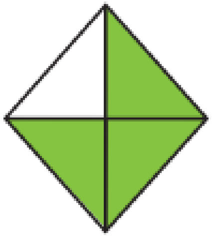


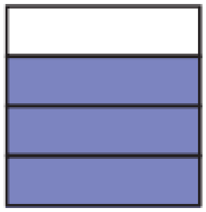


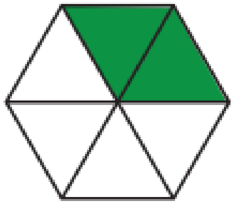




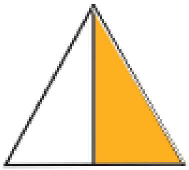


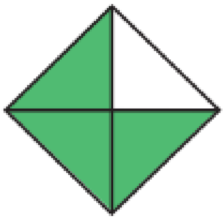


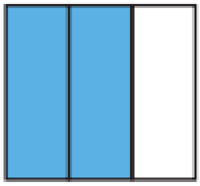


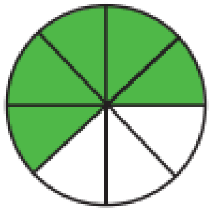


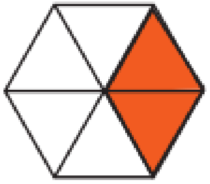
Draw a line between the matching fractions.

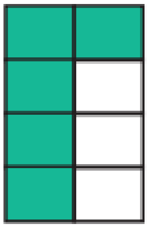


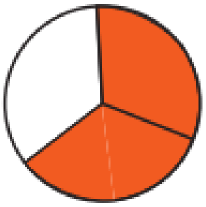


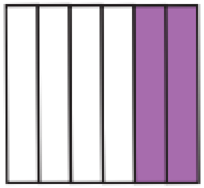


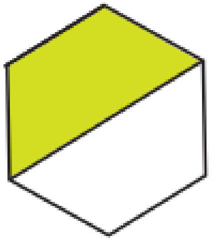


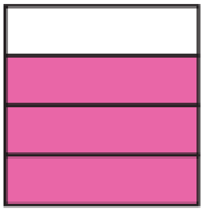












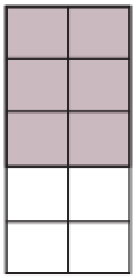
Fraction Terms

A fraction has a **numerator** and a **denominator**.
The **numerator** is the top number above the bar.
The **denominator** is the bottom number below the bar.

$\frac{\textbf{numerator}}{\textbf{denominator}}$

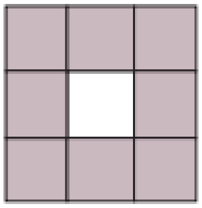
numerator → The number that shows the parts being counted.

denominator → The number that shows the total parts as a whole.



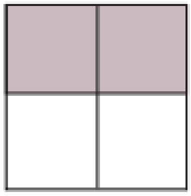
numerator

denominator



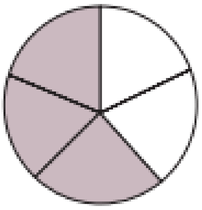
numerator

denominator



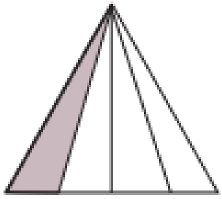
numerator

denominator



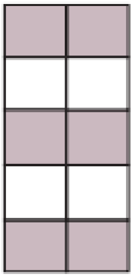
numerator

denominator



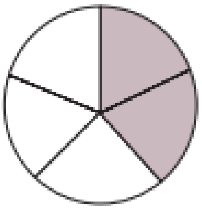
numerator

denominator



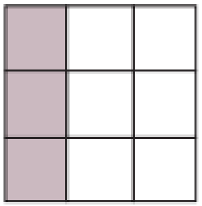
numerator

denominator



numerator

denominator



numerator

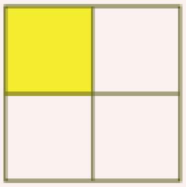
denominator

More worksheets at www.education.com/worksheets

Fractions

$\frac{1}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{4}$	$\frac{2}{4}$	$\frac{3}{4}$
one-half	one-third	two-thirds	one-fourth	two-fourths	three-fourths

Write the fraction for each colored area in numbers and in words.



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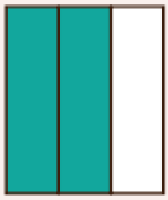

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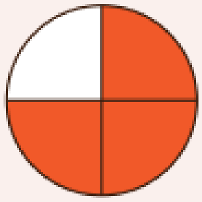
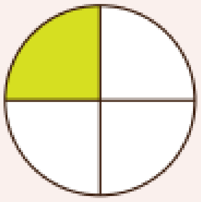
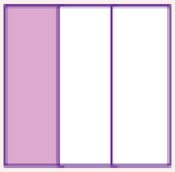


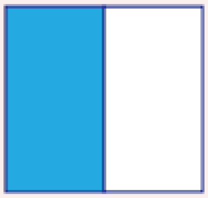
☐/☐ ______________



☐/☐ ______________



☐/☐ ______________



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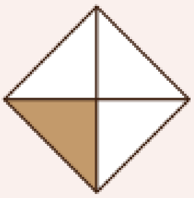

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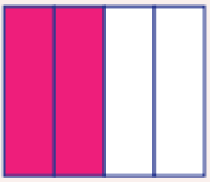


☐/☐ ______________

Circle the correct answer.

A pizza is cut into 4 even pieces. Tim eats 3 pieces. What fraction of the pizza did he eat?

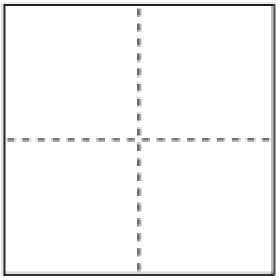
$\frac{1}{3}$ $\frac{3}{4}$ $\frac{4}{3}$

I have 5 robots. 2 of them are red and the rest are blue. What fraction of the robots are red?

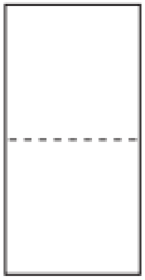
$\frac{2}{5}$ $\frac{2}{3}$ $\frac{1}{2}$

Party Fractions

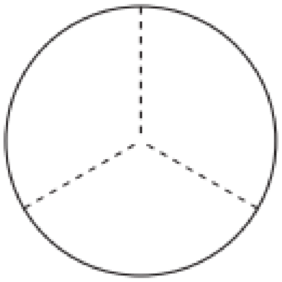
Color the shapes.



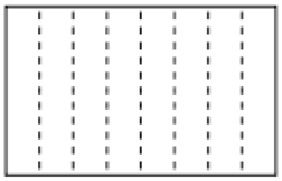
Color $\frac{3}{4}$ of this square blue.



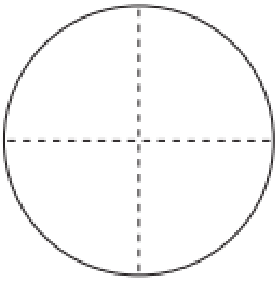
Color $\frac{1}{2}$ of this rectangle purple.



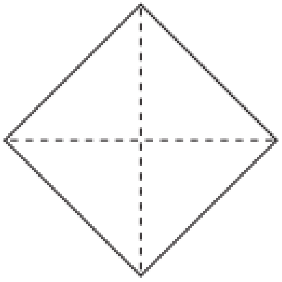
Color $\frac{2}{3}$ of this circle orange.



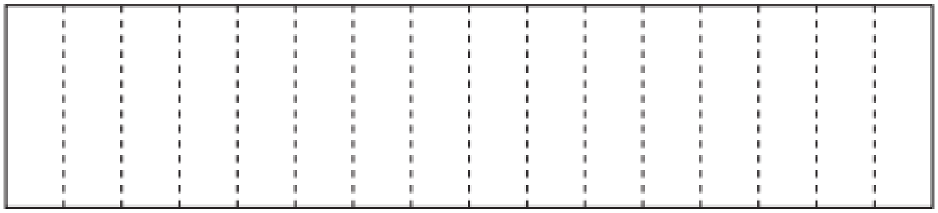
Color $\frac{2}{8}$ of this rectangle green.



Color $\frac{2}{4}$ of this circle yellow.



Color $\frac{1}{4}$ of this diamond pink.



Color $\frac{1}{16}$ of this rectangle orange.

Color $\frac{4}{16}$ of this rectangle purple.

Color $\frac{2}{16}$ of this rectangle green.

Color $\frac{3}{16}$ of this rectangle blue.

Color $\frac{5}{16}$ of this rectangle pink.

What fraction of the rectange is left white? $\frac{\square}{\square}$

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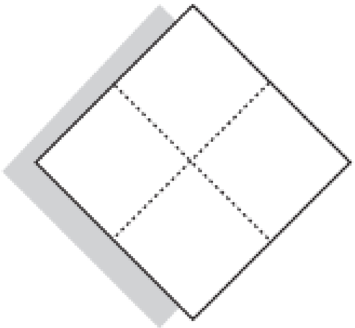
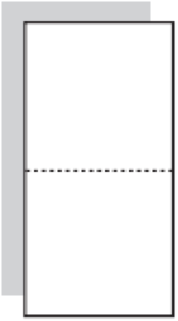
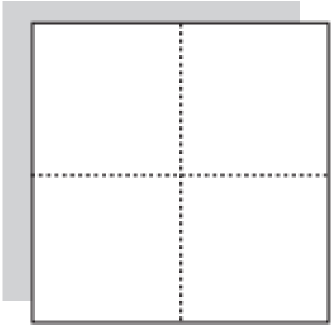
Color The Shapes



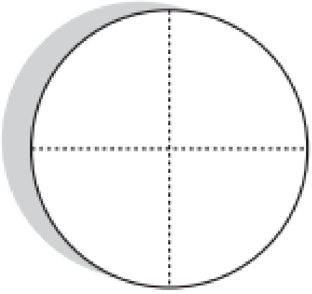
Color $\frac{1}{4}$ of this diamond blue.



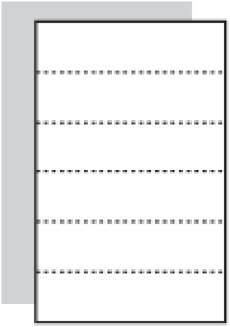
Color $\frac{1}{2}$ of this rectangle orange.



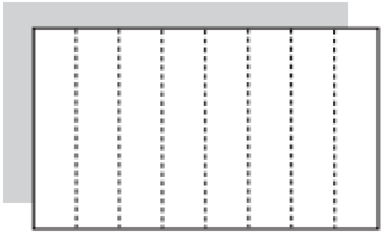
Color $\frac{3}{4}$ of this square red.



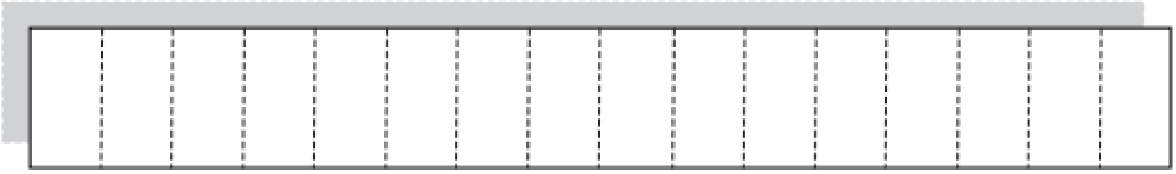
Color $\frac{1}{2}$ of this circle pink.



Color $\frac{4}{6}$ of this rectangle purple.



Color $\frac{5}{8}$ of this rectangle green.



Color $\frac{2}{16}$ of this rectangle green.

Color $\frac{5}{16}$ of this rectangle red.

Color $\frac{3}{16}$ of this rectangle blue.

- Color $\frac{1}{16}$ of this rectangle orange.
- Color $\frac{4}{16}$ of this rectangle purple.
- What fraction of the rectangle is left white?

MAIL CALL! #1

How many letters are there below? ___________

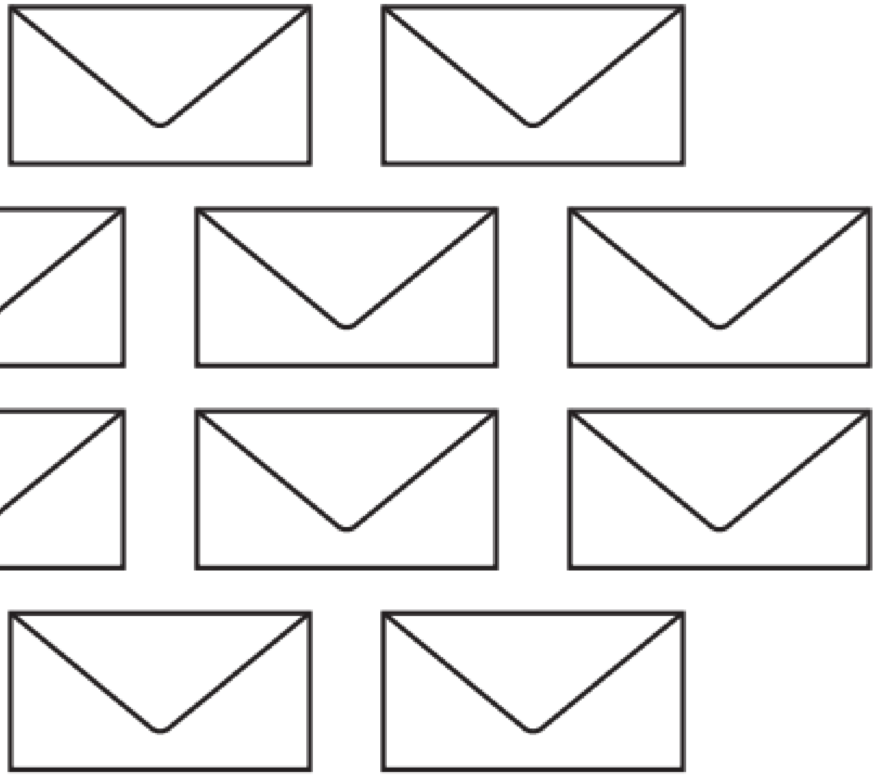
Half of the letters go to the Jones family. Color them **RED**.

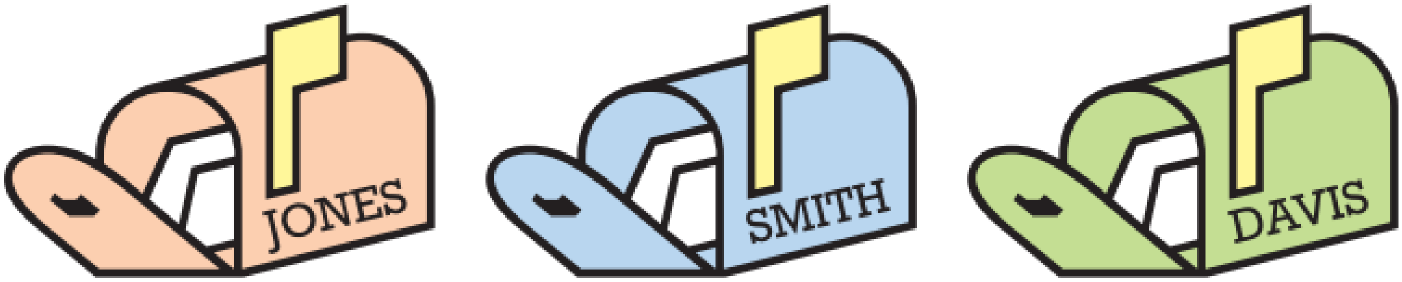
How many letters are left? ___________

2/5 of the remaining letters go the Smith family. Color them **BLUE**.

How many letters are left? ___________

1/3 of the remaining letters go the Davis family. Color them **GREEN**.





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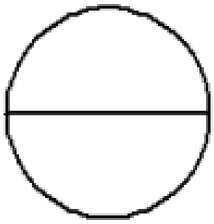
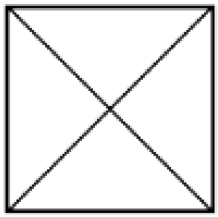
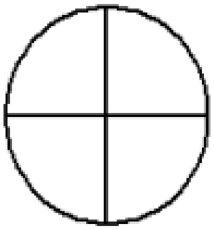
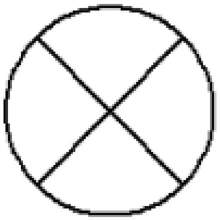
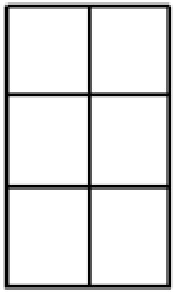
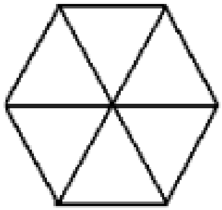
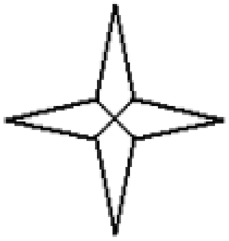
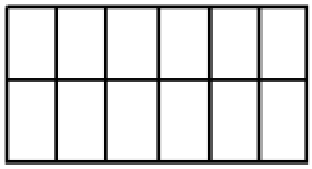
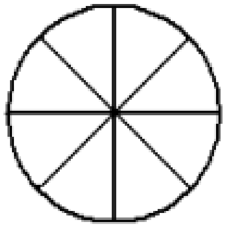
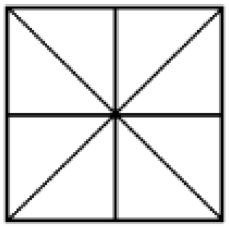
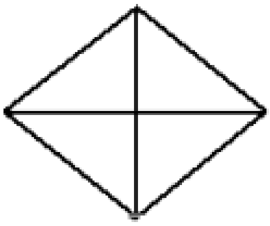
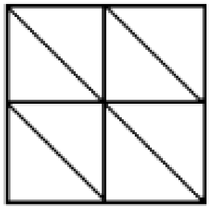
Student Name: ____________________________ **Score:**

Shade the Parts of Shapes

Sheet 1

$\frac{1}{2}$ 	$\frac{3}{4}$ 	$\frac{1}{4}$ 
$\frac{2}{4}$ 	$\frac{5}{6}$ 	$\frac{4}{6}$ 
$\frac{3}{4}$ 	$\frac{7}{12}$ 	$\frac{5}{8}$ 
$\frac{7}{8}$ 	$\frac{3}{4}$ 	$\frac{3}{8}$ 

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Student Name: ______________________ **Score:**

Identify the Numerator and Denominator

Sheet 2

Fraction = $\frac{2}{11}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{4}{7}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{7}{10}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{13}{20}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{1}{9}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{15}{16}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{4}{11}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{3}{8}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{7}{13}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{7}{8}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{8}{9}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{21}{25}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{16}{23}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{2}{7}$ Numerator = ___________ Denominator = _____________

Fraction = $\frac{3}{29}$ Numerator = ___________ Denominator = _____________

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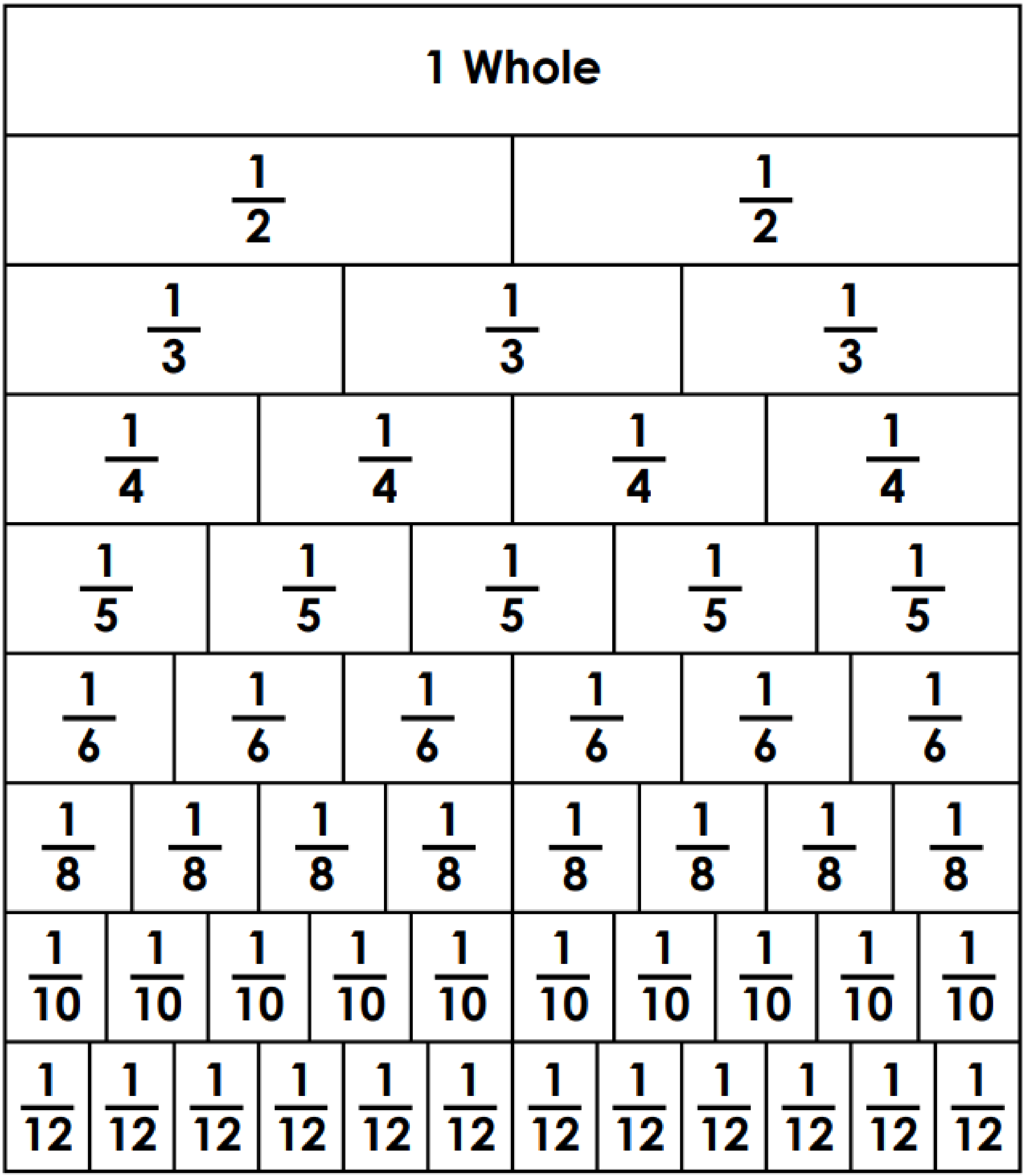
Fraction Strips



1 Whole

$\frac{1}{2}$ $\frac{1}{2}$

$\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$

$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

$\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$

$\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$

$\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$

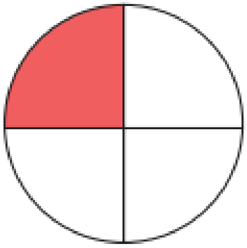
$\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$

$\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$

Fractions

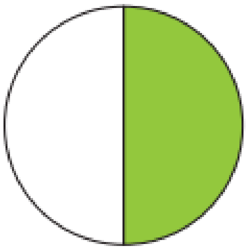
What fraction does the colored area show?
Color in the bubble next to the correct answer.

1.



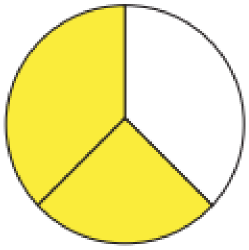
○ $\frac{1}{2}$ ○ $\frac{3}{4}$ ○ $\frac{1}{4}$ ○ $\frac{1}{3}$

2.



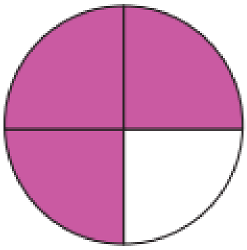
○ $\frac{2}{3}$ ○ $\frac{2}{4}$ ○ $\frac{1}{4}$ ○ $\frac{1}{2}$

3.



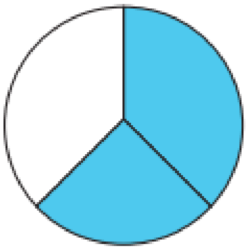
○ $\frac{3}{4}$ ○ $\frac{1}{2}$ ○ $\frac{2}{3}$ ○ $\frac{1}{3}$

4.



○ $\frac{2}{4}$ ○ $\frac{3}{4}$ ○ $\frac{1}{3}$ ○ $\frac{1}{4}$

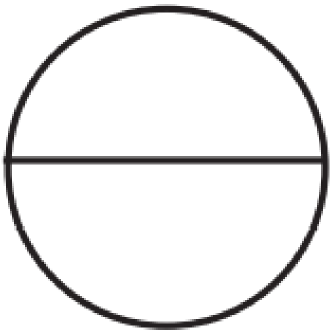
5.

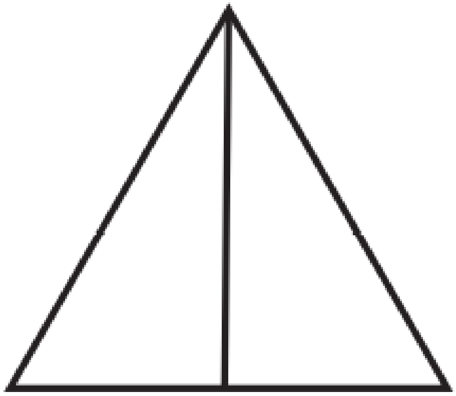


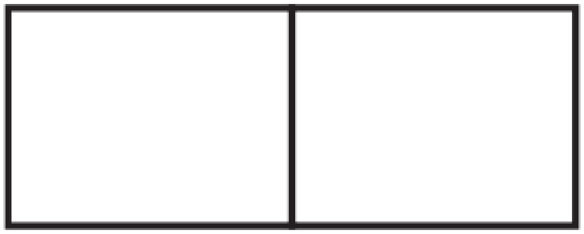
○ $\frac{3}{4}$ ○ $\frac{1}{3}$ ○ $\frac{2}{4}$ ○ $\frac{2}{3}$

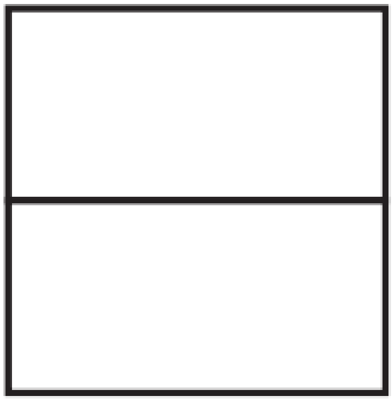
Coloring 1/2

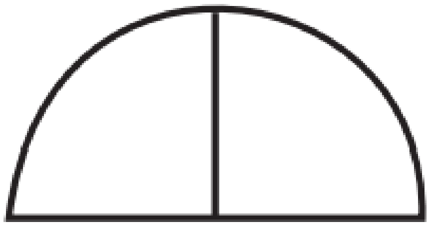
Color in the fraction of each shape written below it.











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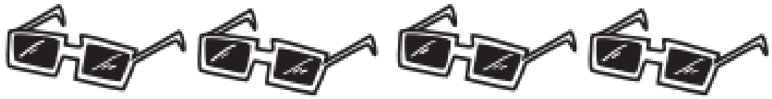
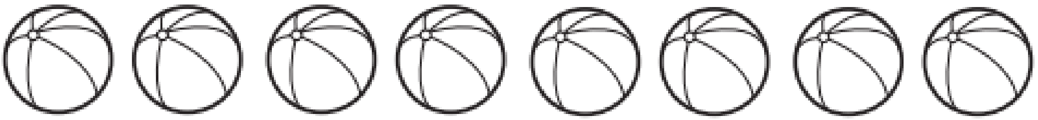
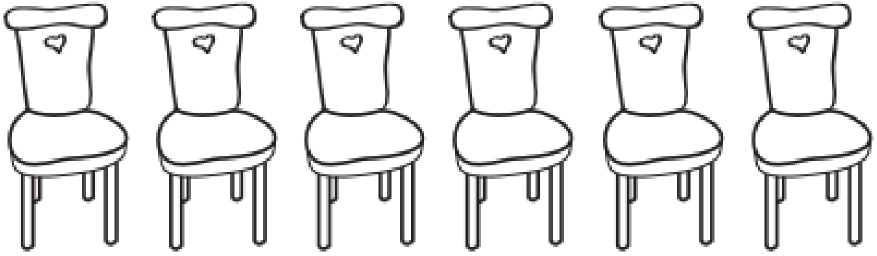
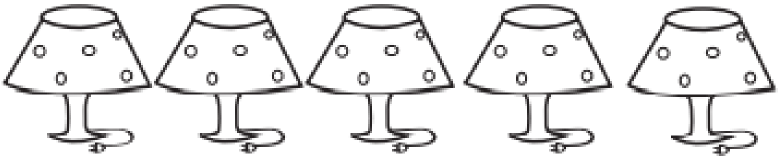
Find $\frac{1}{2}$

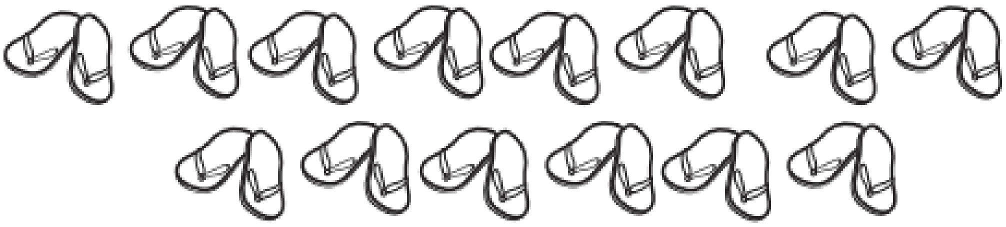
Circle $\frac{1}{2}$ of each group of items. Note: One of them does not split in half evenly. Do you know which one?











August Math Pacing Guide
7th Grade

1. Number System (NS)
 * M.EE.7.NS.1 - Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one.

Learning Goal:
- Level 2-3 – I will add fractions with like denominators (halves, thirds, fourths, and tenths) to solve a math problem.
- Level 1 – I will count fractional objects.

Essential Questions:
- How can I represent these fractions?
- What is the relationship between the two fractions?
- What is the sum of two fractions?
- Which part of the fractions do I add?

Vocabulary:
- **numerator** - the top number in a fraction, which shows the number of parts of the whole taken.
- **denominator** - the bottom number in a fraction, which shows the number of parts the whole has been divided into.
- **equal** - alike in size, value or amount to something else.
- **fraction** - a representation of a division of a number; a part of a whole.
- **half** - either of two equal parts of something.
- **quarter** - one of four equal parts into which something is divided.
- **whole number** - a positive integer or zero. 1, 15, 30 and 894 are examples.

Mini-Map for M.EE.7.NS.1

Subject: Mathematics
The Number System (NS)
Grade: 7

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.7.NS.1 Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one.	**M.7.NS.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

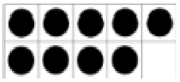
Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate understanding of a subset by recognizing a subset as a set or group of objects within a larger set that share an attribute.	Recognize each object as the part of a whole or unit when shown a whole or unit containing a group of objects.	Communicate understanding that when fractional parts are added, it produces a larger portion of the whole, and when fractional parts are separated, it results in a smaller portion of the whole. Decompose fractions into sums of unit fractions with the same denominator (e.g., 3/7 = 1/7 + 1/7 + 1/7).	Add two fractions with common denominators (e.g., 2/5 + 1/5 = 3/5).	Add or subtract two fractions where one fraction has a denominator of 10 and one has a denominator of 100 (e.g., 5/10 + 1/100 = 50/100 + 1/100 = 51/100).

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

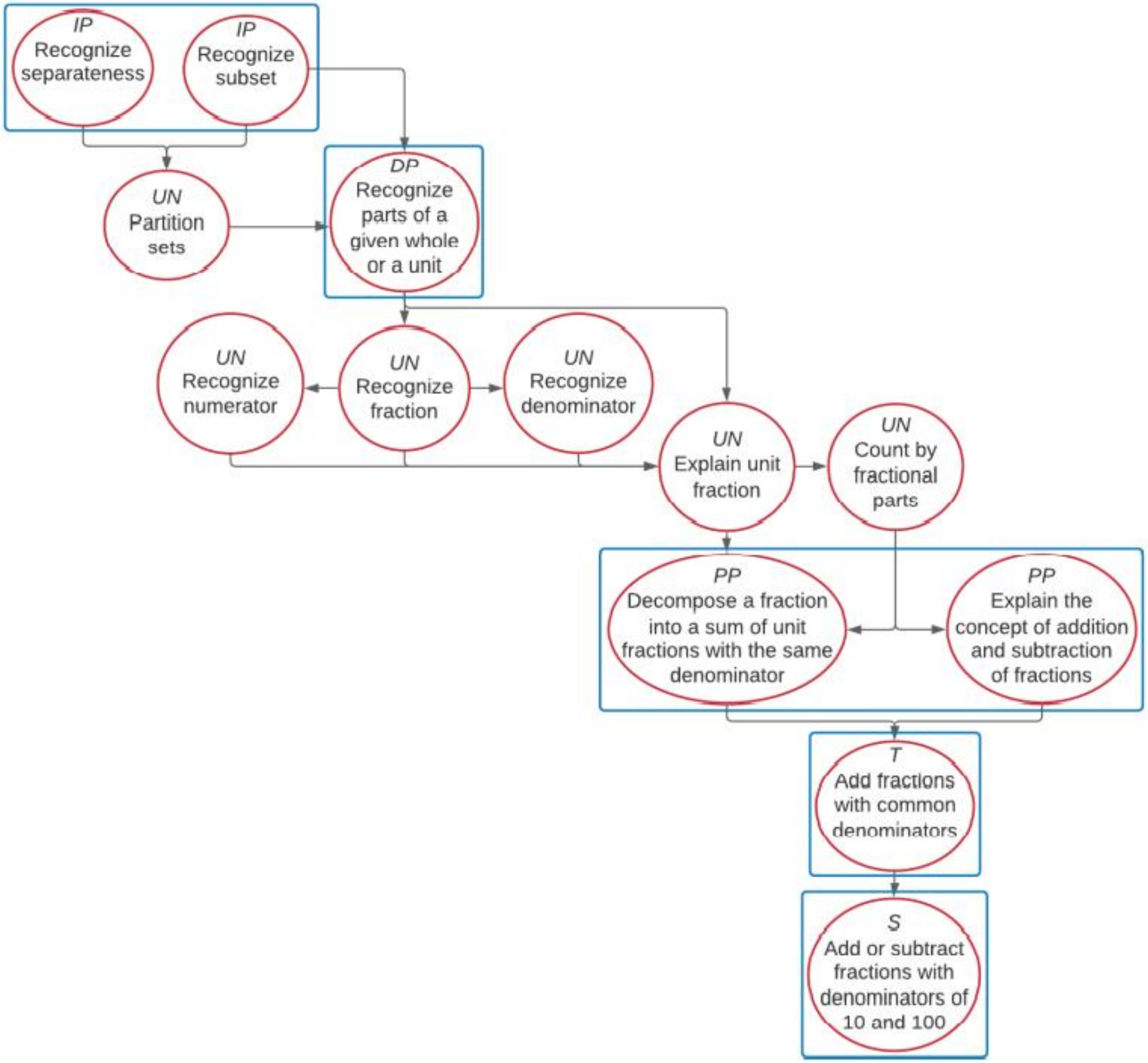
Adding fractions requires a student to be able to recognize that two or more sets or groups of items exist. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or separated out. As educators present a set, label it (e.g., two balls, one marker, three CDs), count the items, label it again, and encourage students to use numerals to label and count the separate sets. Use tools like the ten-frame to point out whole and parts (e.g., a row of 5 dots and a row of 4 dots are parts or subsets of 9).



How is the Distal Precursor related to the Target?

As students begin to understand labeling, counting small sets, and recognizing wholes and parts of objects and sets, use a variety of tools (e.g., ten-frames, egg cartons, a collection of items in a category [clothes: shoes, socks, pants], your hands) to label and count the sets, and label and count the subsets.

M.EE.7.NS.1 Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one.



Map Key

IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Rubric of Student Success

M.EE.7.NS.1 - Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one.

Level 3 Students will… Successor and Target Students will…	Level 2 Students will… Proximal Precursor and Distal Precursor Students will…	Level 1 Students will… Initial Precursor Students will…
Level 3 Use objects or a model to add two fractional units (e.g., 1/4 cup + 1/4 cup is the same is 1/2 cup).	**Level 2** Model addition of two fractional units.	**Level 1** Match fractional parts of an object to model the solution to an addition problem through an active participation response.
Successor • Add fractions with denominators of 10 and 100 Target • Add fractions with common denominators	Proximal Precursor • Decompose a fraction into a sum of unit fractions with the same denominator • Explain the concept of addition and subtraction of subtractions Distal Precursor • Recognize parts of a given whole or a unit	Initial Precursor • Recognize separateness • Recognize subset

Instructional Ideas

M.EE.7.NS.1 - Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one.

Numbers can be represented, displayed, converted, and compared.

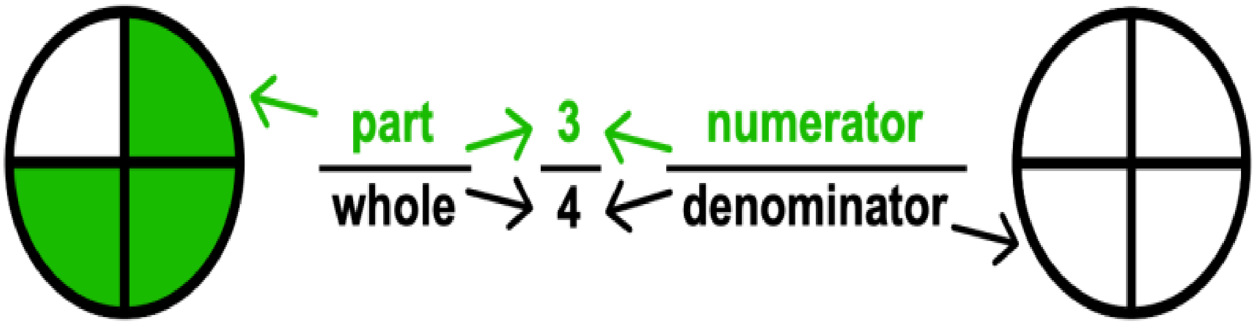
The big idea is that concepts and properties of addition are the same whether using whole numbers or fractions.

- Introduce the activity by asking essential questions about fractions.
- Display a circle or other shape with two lines cutting it into 4 equal parts and ask, “How many parts is this shape cut into?” Discuss students’ responses.
- Review and discuss the numerator and denominator and what each one represents.
- Discuss fraction parts and say, “If two fractions have the same denominator, they are parts of a whole that has been divided into the same number of parts. For example, 1/4 is one of the pieces and 3/4 is 3 of the same size pieces. We can subtract to get a difference of 2/4 or 2 of the same size pieces.
- Tell students it is their job to recognize, count, and subtract fractions.
- Remind students that when they see a minus sign, they subtract the two numerators and keep the denominator the same.
- Use appropriate manipulatives to establish understanding of concepts.
- Students may use a calculator as needed and does not count against their understanding of the standard.
- Included worksheets are examples of what to look for when finding additional materials that best fits your students needs.

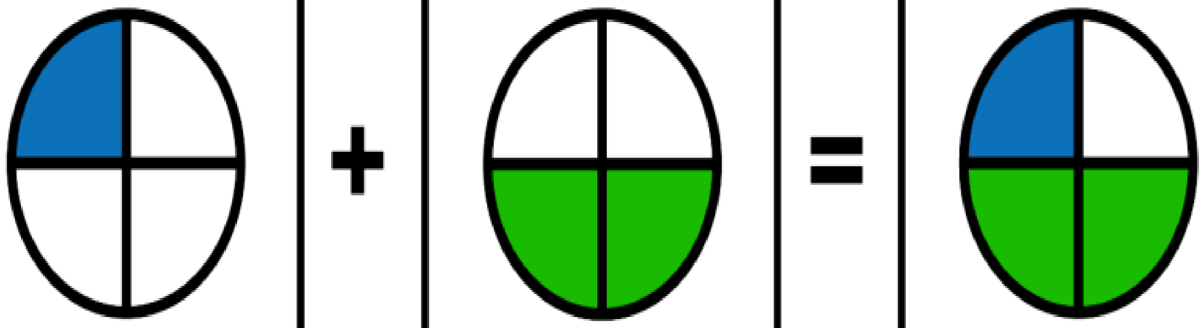
Additional Instructional Ideas

- Go to website for additional instructional resources, materials, and activities for lessons:
  - https://www.msnowakhomeroom.com/2a-fraction-unit.html
  - https://www.tutoringhour.com/lessons/adding-like-fractions

+ Adding Fractions



When the whole is divided into the same number, add the parts together.



$$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$$

When the denominators are the same, keep the denominator and add the numerators.

Coconut Addition

Add the fractions.

To add fractions that have the same denominator, just add the numerators. The denominator stays the same.

$\frac{1}{2}$ ← numerator ← denominator

$$\frac{1}{3} + \frac{1}{3} = \frac{\square}{\square}$$

$$\frac{2}{4} + \frac{1}{4} = \frac{\square}{\square}$$

$$\frac{7}{12} + \frac{3}{12} = \frac{\square}{\square}$$

$$\frac{2}{10} + \frac{4}{10} = \frac{\square}{\square}$$

$$\frac{3}{6} + \frac{2}{6} = \frac{\square}{\square}$$

$$\frac{3}{7} + \frac{2}{7} = \frac{\square}{\square}$$

$$\frac{4}{8} + \frac{3}{8} = \frac{\square}{\square}$$

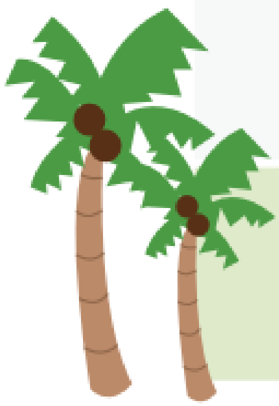
$$\frac{2}{6} + \frac{2}{6} = \frac{\square}{\square}$$

$$\frac{2}{4} + \frac{1}{4} = \frac{\square}{\square}$$

$$\frac{1}{5} + \frac{3}{5} = \frac{\square}{\square}$$

$$\frac{2}{8} + \frac{1}{8} = \frac{\square}{\square}$$

$$\frac{2}{9} + \frac{3}{9} = \frac{\square}{\square}$$

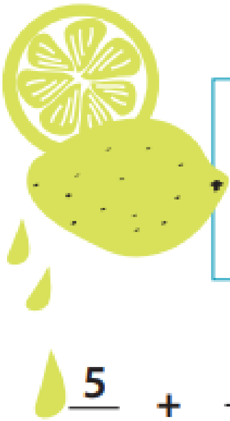


Created by : education.com
www.education.com/worksheets

Math
Fractions

Adding Fractions
with the same denominator

Write the sum of each fraction below. Remember: when adding fractions with the same denominator, simply add the numerators and keep the denominator the same.



$$\frac{3}{5} \quad \begin{matrix} \swarrow \text{numerator} \\ \swarrow \text{denominator} \end{matrix} \qquad \frac{3}{5} + \frac{1}{5} = \frac{4}{5}$$

$\frac{5}{5} + \frac{8}{5} = \square$ $\qquad$ $\frac{3}{7} + \frac{1}{7} = \square$

$\frac{6}{3} + \frac{4}{3} = \square$ $\qquad$ $\frac{7}{4} + \frac{8}{4} = \square$

$\frac{11}{9} + \frac{5}{9} = \square$ $\qquad$ $\frac{9}{8} + \frac{9}{8} = \square$

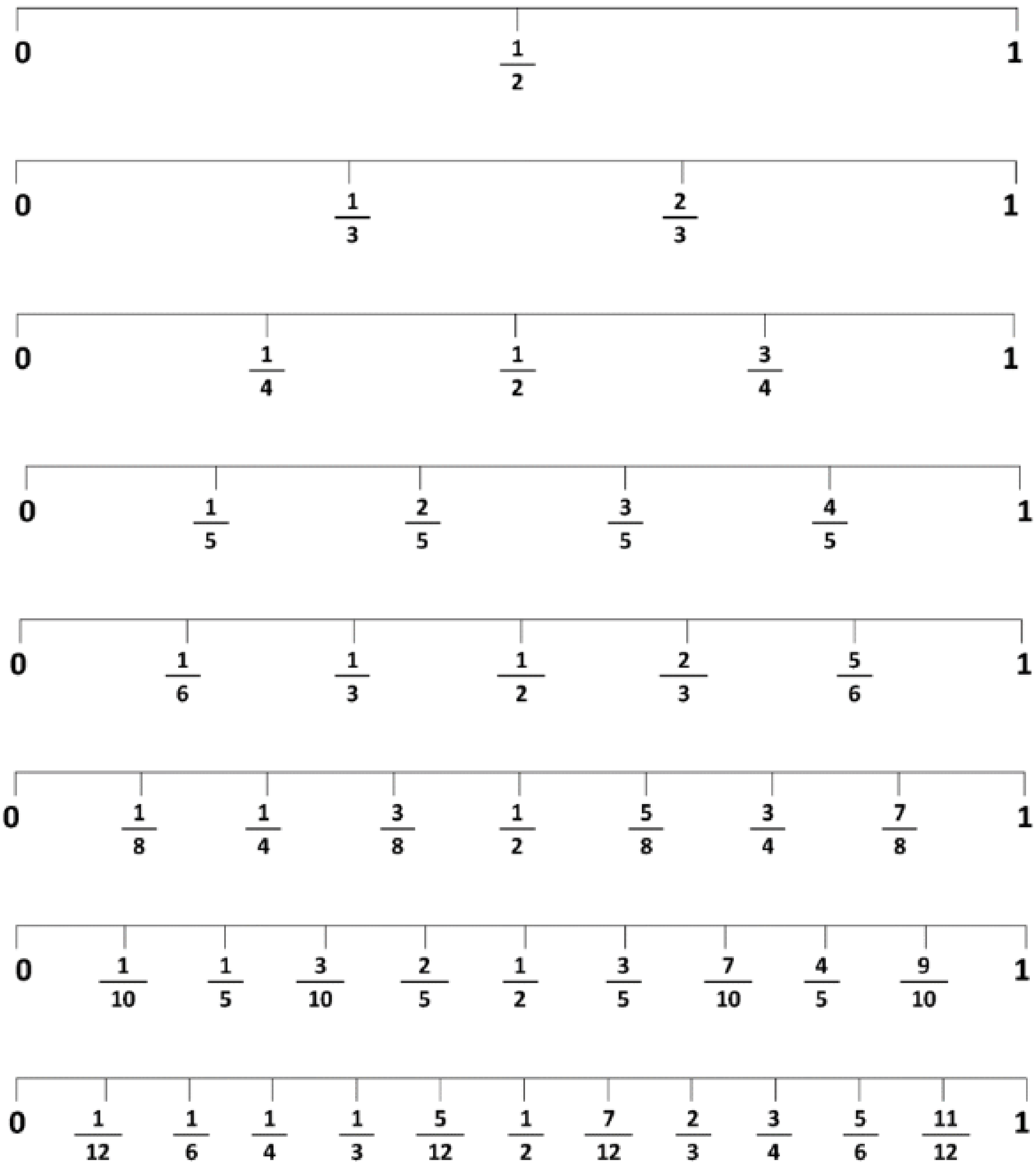
$\frac{10}{12} + \frac{12}{12} = \square$ $\qquad$ $\frac{17}{22} + \frac{3}{22} = \square$

$\frac{22}{50} + \frac{15}{50} + \frac{17}{50} = \square$

$\frac{35}{100} + \frac{6}{100} + \frac{79}{100} + \frac{14}{100} = \square$

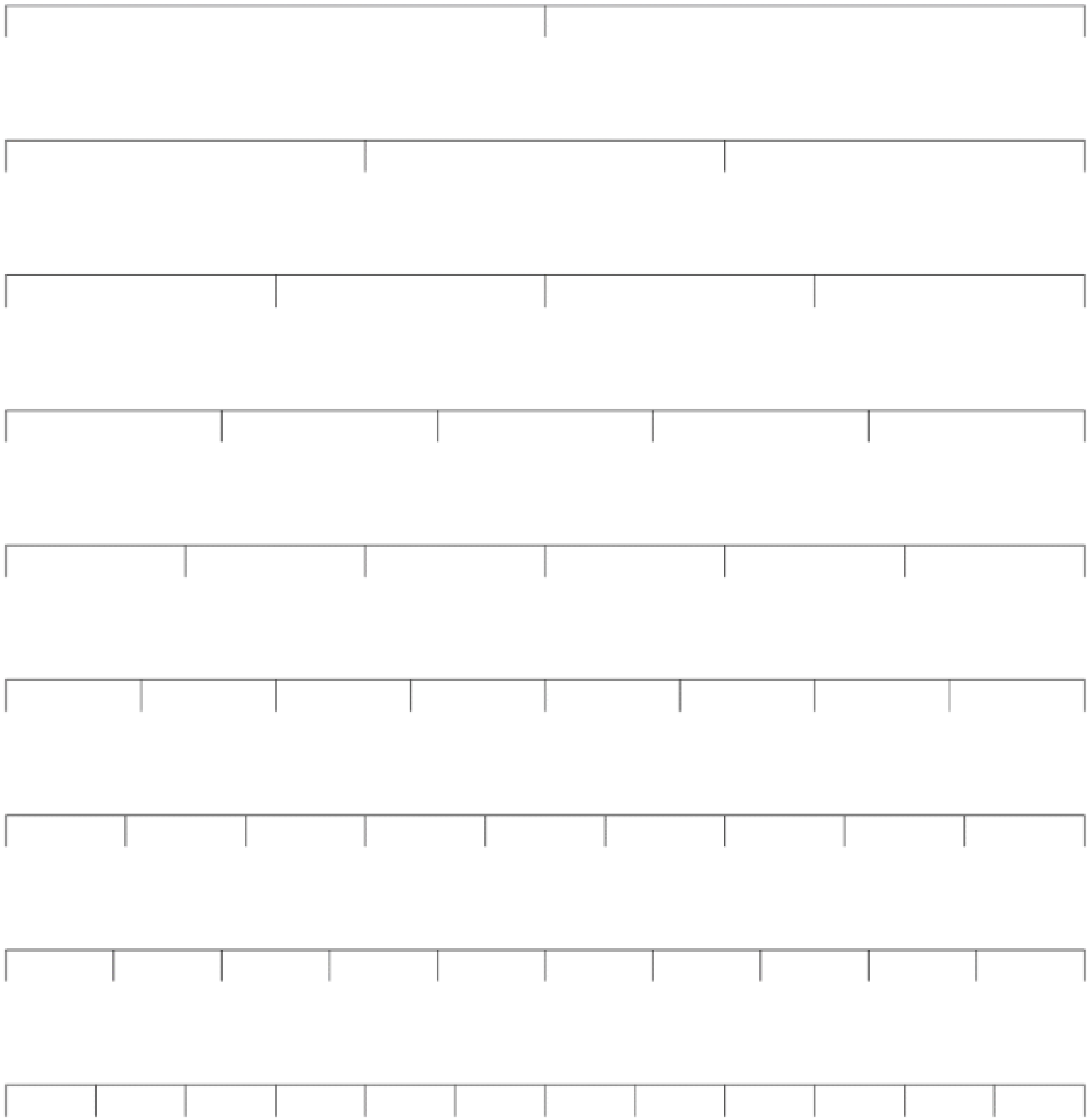
Name Date

FRACTION NUMBER LINES TO 1



Name Date

EMPTY FRACTION NUMBER LINES 0 TO 1



Adding Fractions (A)

Name: ____________________ Date: ______________

Add each pair of fractions and simplify if necessary.

1. $\frac{7}{13} + \frac{4}{13}$
2. $\frac{7}{22} + \frac{14}{22}$
3. $\frac{17}{21} + \frac{3}{21}$
4. $\frac{1}{17} + \frac{13}{17}$
5. $\frac{5}{8} + \frac{2}{8}$
6. $\frac{2}{24} + \frac{3}{24}$
7. $\frac{6}{12} + \frac{2}{12}$
8. $\frac{9}{20} + \frac{3}{20}$
9. $\frac{11}{14} + \frac{1}{14}$
10. $\frac{13}{16} + \frac{2}{16}$
11. $\frac{11}{19} + \frac{7}{19}$
12. $\frac{1}{10} + \frac{7}{10}$
13. $\frac{7}{11} + \frac{1}{11}$
14. $\frac{1}{6} + \frac{3}{6}$
15. $\frac{4}{23} + \frac{1}{23}$
16. $\frac{9}{15} + \frac{3}{15}$
17. $\frac{1}{3} + \frac{1}{3}$
18. $\frac{4}{7} + \frac{2}{7}$
19. $\frac{3}{9} + \frac{5}{9}$
20. $\frac{1}{4} + \frac{2}{4}$

2. Ratio and Proportions (RP)
* <u>M.EE.7.RP.1-3</u> - Use a ratio to model or describe a relationship.

Learning Goal:

- Level 2-3 – I will model and write a ratio to describe a relationship.
- Level 1 – I will match objects that represent a relationship.

Essential Questions:

- What does this ratio tell me?
- How can I model this relationship?
- How do you write a ratio that describes part-to-part or part-to-whole.

Vocabulary:

- **Ratio** - a way to show a relationship or compare two numbers of the same kind.
- **Part-to-part** - a ratio that compares a selected number of parts to a number of other parts in a whole.
- **Part-to-whole** - a ratio that compares a selected number of parts to the total number of parts in a whole.
- **To** – what is said when we state 5:8 as 5 "to" 8.
- **Out of** – what is said when we state 5/8 as a fraction to mean that 5 "out of" 8.
- **Comparison** - relations among two numbers or quantities.

Mini-Map for M.EE.7.RP.1-3

Subject: Mathematics
Ratios and Proportional Relationships (RP)
Grade: 7

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.7.RP.1-3 Use a ratio to model or describe a relationship.	**M.7.RP.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. **M.7.RP.2** Recognize and represent proportional relationships between quantities. **M.7.RP.3** Use proportional relationships to solve multistep ratio and percent problems.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate understanding of set by recognizing a group of objects sharing an attribute. Communicate understanding of a subset by recognizing a subset as a set or group of objects within a larger set that share an attribute.	Divide familiar shapes, such as circles, squares, and/or rectangles, into two or more equal parts. Demonstrate understanding of a unit fraction (e.g., 1/4) as the quantity formed by one part when a whole is partitioned into *n* (e.g., 4) equal parts. Recognize a fraction as a number expressed as a quotient of two integers in the form	Communicate understanding that a ratio (e.g., 5:1) represents the relationship between two quantities (i.e., 5 of object *a* for every 1 object *b*). When shown two groups of objects, one group with one object and another group with multiple objects (e.g., 4), recognize that there are four times as many objects in the second	When shown two groups of multiple objects (e.g., one group with two objects and another group with three objects), recognize that for every two objects in the first group there are three objects in the second group. When shown two groups of multiple objects, represent a many-to-many ratio of the parts as 2:3.	Communicate understanding that rates (i.e., *a*/*b*) can be expressed as ratios (i.e., *a*:*b*). For example, instructions for a craft that uses 2/3 piece of paper for each drawing can be expressed in the ratio of pieces of paper to number of drawings as 2:3.

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
	a/*b*, with *b* not equal to zero.	group as in the first group.		

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

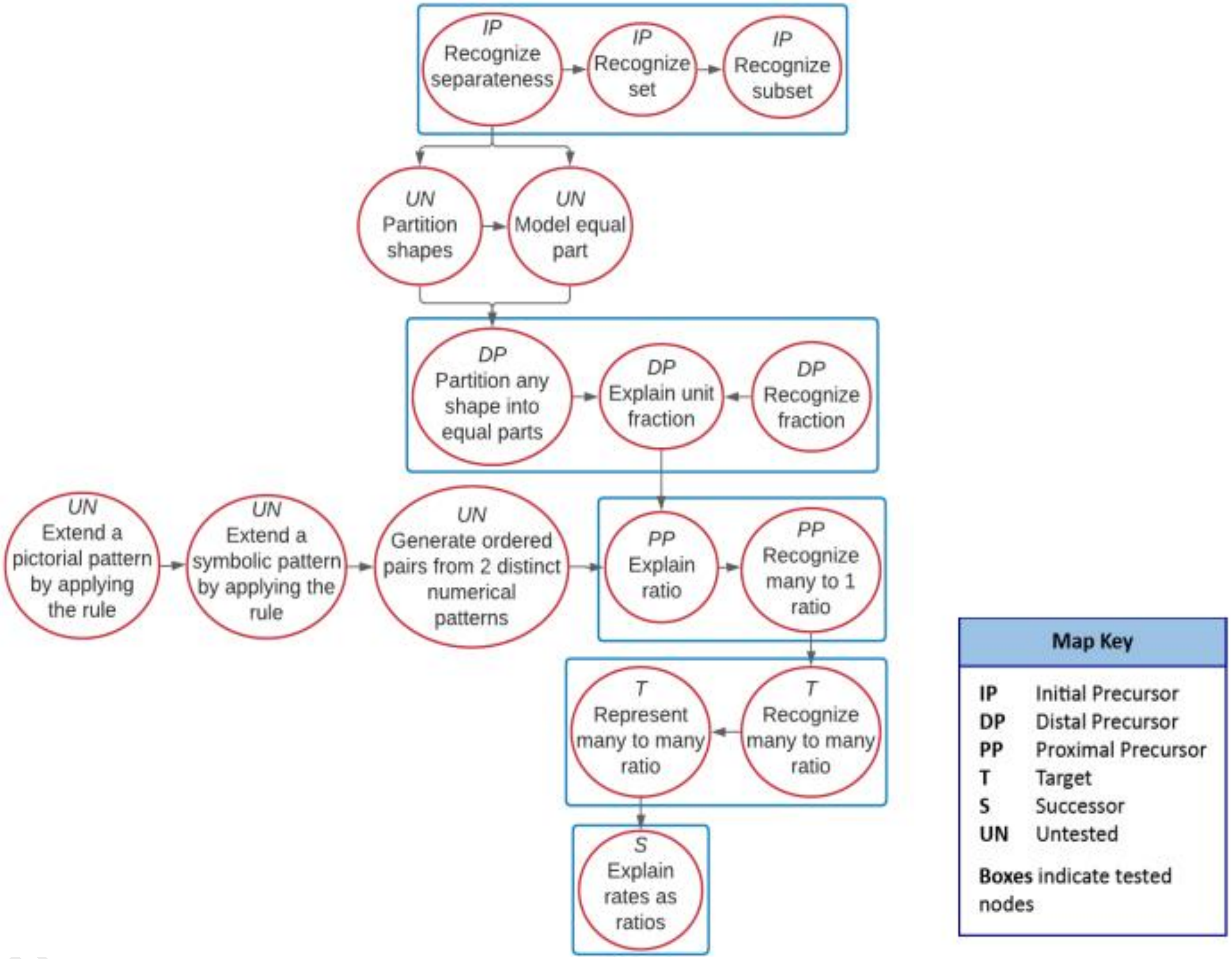
How is the Initial Precursor related to the Target?

In order to understand ratios, students need to gain experience with creating sets. Educators can provide students with opportunities to take a set of objects (e.g., tiles, linking cubes, buttons) and separate them based on a given characteristic (e.g., shape, color, size) into two distinct sets. Then, separate the objects again based on another characteristic.

How is the Distal Precursor related to the Target?

As students become more adept at tracking discrete objects, they will begin working on one-to-one distribution of objects to person, objects to objects, and objects to available space (e.g., giving each person in the group a pencil; given four counters, they would line up four more counters in front of or on top of the first set; given three chairs at a table, the student would place a cup on the table for each available chair). As students understanding of one-to-one distribution develops, provide students many opportunities to recognize equivalence in sets with same items and then sets with differing items. As students work on all these skills and concepts, continue to draw their attention to parts and wholes.

M.EE.7.RP.1-3 Use a ratio to model or describe a relationship.



IP	Initial Precursor
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PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Rubric of Student Success

M.EE.7.RP.1-3 - Use a ratio to model or describe a relationship.

Level 3 Students will… Successor and Target Students will…	Level 2 Students will… Proximal Precursor and Distal Precursor Students will…	Level 1 Students will… Initial Precursor Students will…
Level 3 Identify and write a ratio to describe part-to-part and part-to-whole relationships in the context of a real-world scenario.	**Level 2** Model part-to-part and part-to-whole relationships in the context of a real-world scenario.	**Level 1** Match objects represented in part-to-part and part-to-whole relationships in the context of a real-world scenario.
Successor • Explain rates as ratios **Target** • Represent many to many ratio • Recognize many to many ratio	**Proximal Precursor** • Explain ratio • Recognize many to 1 ratio **Distal Precursor** • Partition any shape into equal parts • Explain unit fraction • Recognize fraction	**Initial Precursor** • Recognize separateness • Recognize set • Recognize subset

Instructional Ideas

M.EE.7.RP.1-3 - Use a ratio to model or describe a relationship.

Ratios show a comparison and can be used for mathematical reasoning.

The big idea is that a ratio is used to describe a relationship to part-part or part-whole (total).

- Introduce by asking the essential questions.
- Ask how many wheels does every bicycle have – 1 or 2? Discuss students' responses.
    - Discuss that a bicycle and the number of wheels it has represents a part-to-part ratio. For every 1 bicycle, there are 2 wheels. This is a ratio of 1 bicycle to 2 wheels. A ratio compares two numbers and describe a pattern. If there are two bicycles, then there are 4 wheels. Each time another bicycle gets added, 2 more wheels are added.
- Explain part-to-whole (total) ratio. A part-to-whole (total) ratio compares part of the total to the overall total. The part-to-whole (total) ratio of red markers to total markers is 1 to 8.
- Students will be modeling, writing, and matching ratios to describe a real-life relationship.
- Use manipulatives as needed.
- Provide students with their own ratio anchor chart.
- Included worksheets are examples of what to look for when finding additional materials that best fits your students needs.

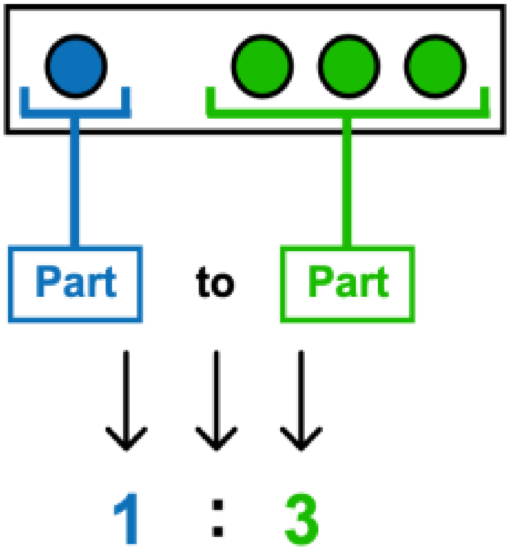
Additional Instructional Ideas

- Go to website for additional instructional resources, materials, and activities for lessons:
    - https://www.msnowakhomeroom.com/1a-ratios.html

1:3 Ratios: Part-to-Part

A ratio compares two numbers and shows how they are related.
A part-to-part ratio shows how one part compares to another part.

1 blue ball for **every** 3 green balls.

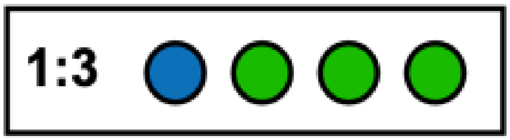


The blue ball is one part.
The green balls are another part.

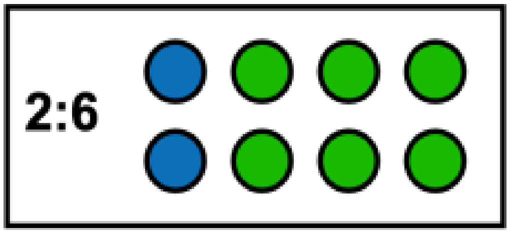
The ratio is 1 blue ball to 3 green balls.
It is a 1 to 3 ratio.

A ratio describes a pattern.

We draw 1 blue ball for
every 3 green balls we draw.



So, for 2 blue balls,
we draw 6 green balls.



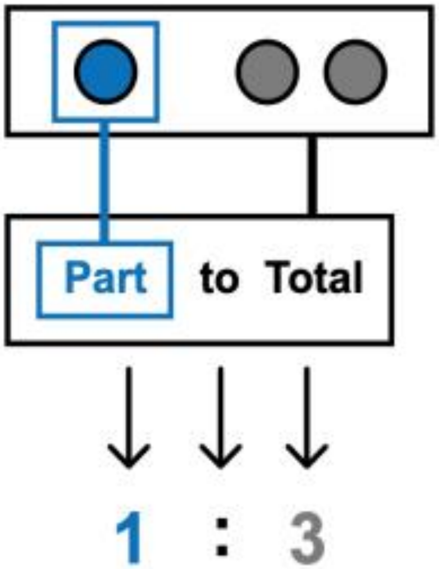
1:3 Ratios: Part-to-Total

A ratio compares two numbers and shows how they are related.
A part-to-total ratio shows how one part of the total compares to the total.

1 blue ball for **every** 3 total balls.

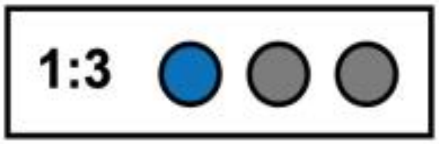
The blue ball is one part of the total balls.

The ratio is 1 blue ball to 3 total balls.
It is a 1 to 3 ratio.

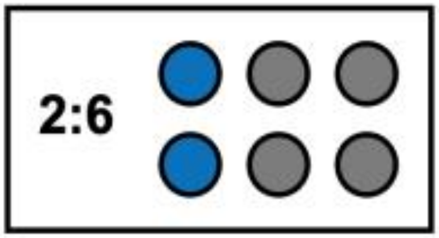


A ratio describes a pattern.

We draw 1 blue ball for
every 3 total balls we draw.



So, for 2 blue balls,
we draw 6 total balls.



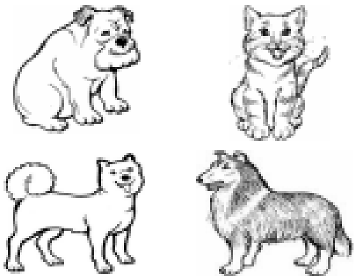
Name: ____________________________

Ratio

Ratios are pairs of numbers that are used to compare two quantities.

Ratios can be written three ways - <u>with the word *to*</u>, <u>with a colon</u>, or <u>as a fraction</u>.

example: What is the ratio of dogs to cats?



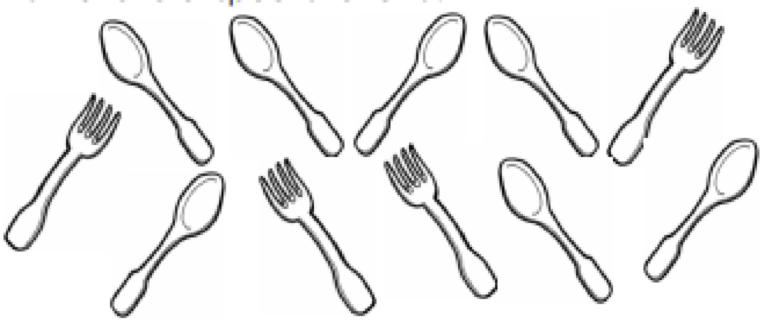
3 to 1

3:1

$\frac{3}{1}$

Write each ratio three ways.

1. What is the ratio of spoons to forks?



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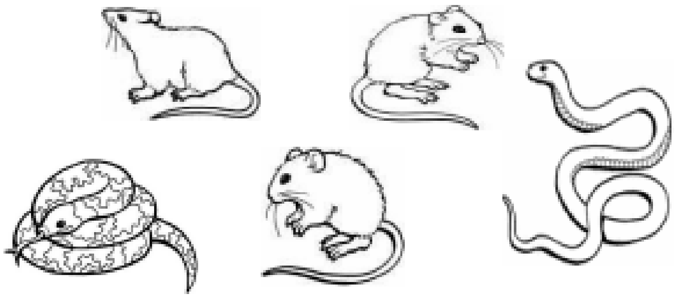
2. What is the ratio of snakes to mice?



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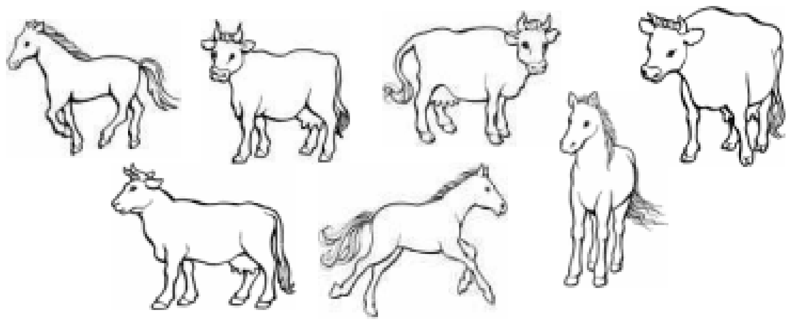
3. What is the ratio of cows to horses?



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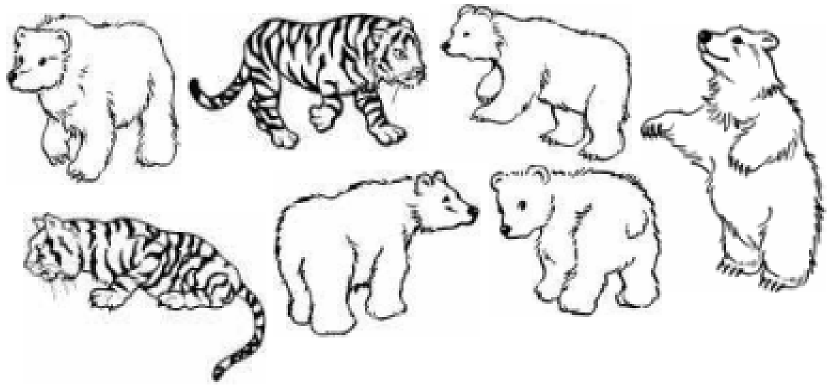
4. What is the ratio of tigers to bears?



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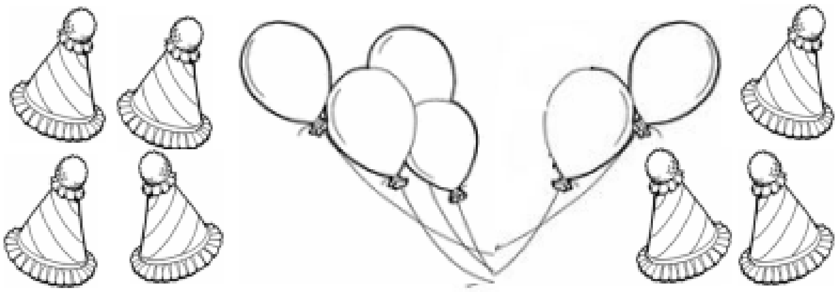
5. What is the ratio of party hats to balloons?



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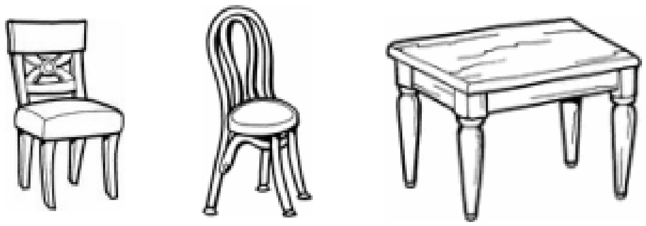
6. What is the ratio of tables to chairs?



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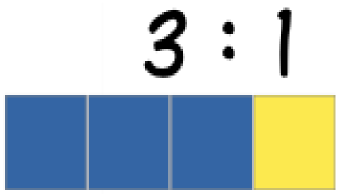
Ratios

A ratio compares values.

A ratio says how much of one thing there is compared to another thing.



There are 3 blue squares to 1 yellow square

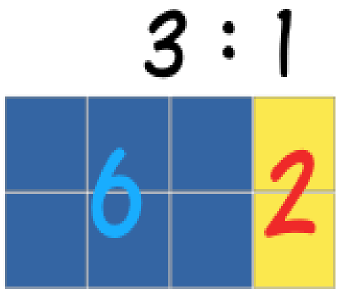
Ratios can be shown in different ways:

Using the ":" to separate the values: 3 : 1

Instead of the ":" we can use the word "to": 3 to 1

Or write it like a fraction: $\frac{3}{1}$

A ratio can be scaled up:



Here the ratio is also 3 blue squares to 1 yellow square, even though there are more squares.

"Part-to-Part" and "Part-to-Whole" Ratios

The examples so far have been "part-to-part" (comparing one part to another part).

But a ratio can also show a part compared to the **whole lot**.

Example: There are 5 pups, 2 are boys, and 3 are girls

Part-to-Part:

The ratio of boys to girls is 2:3 or $^2/_3$

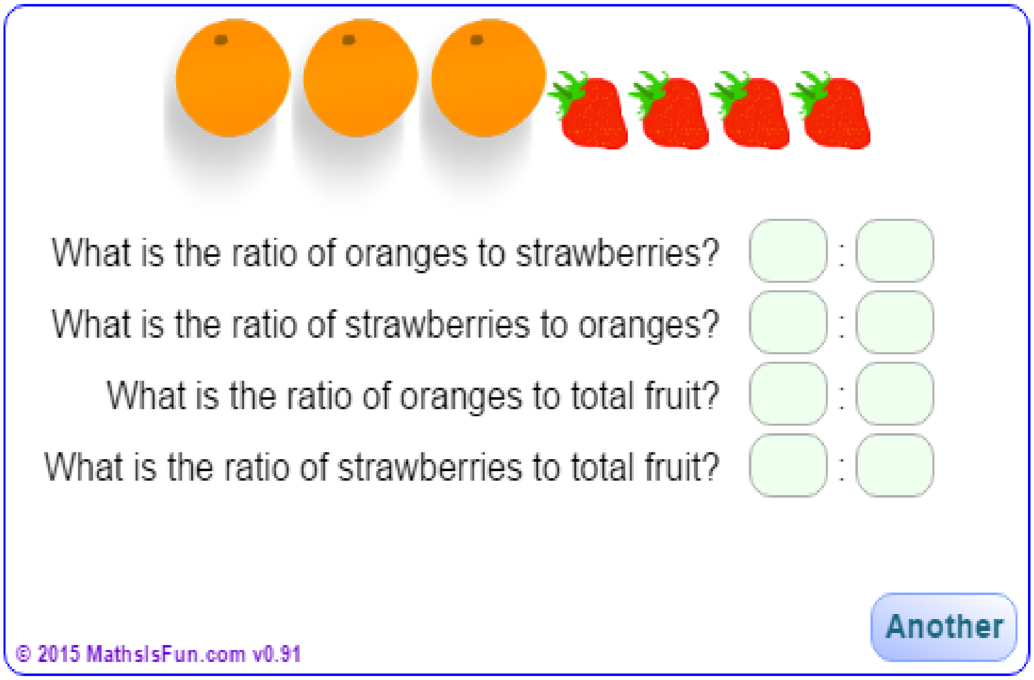
The ratio of girls to boys is 3:2 or $^3/_2$

Part-to-Whole:

The ratio of boys to **all** pups is 2:5 or $^2/_5$

The ratio of girls to **all** pups is 3:5 or $^3/_5$

Try It Yourself



What is the ratio of oranges to strawberries? :

What is the ratio of strawberries to oranges? :

What is the ratio of oranges to total fruit? :

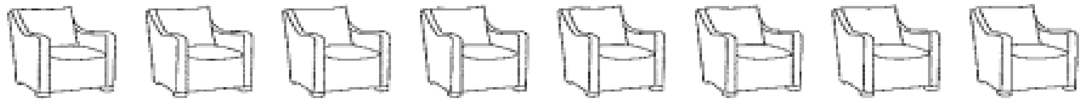
What is the ratio of strawberries to total fruit? :

Name : ____________________ Score : ________________

Ratio: Coloring Activity

Sheet 2

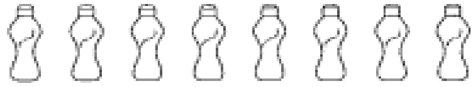
1) Color 3 sofas yellow and the rest pink.



What is the ratio of pink sofas to yellow sofas?

____

2) Color 6 bottles brown and the rest violet.



What is the ratio of brown bottles to violet bottles?

____

3) Color 5 umbrellas blue and the rest orange.

What is the ratio of orange umbrellas to blue umbrellas?

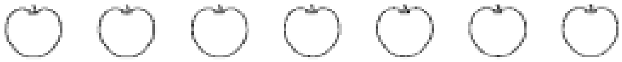
____

4) Color 2 whistles pink and the rest brown.

What is the ratio of pink whistles to brown whistles?

____

5) Color 4 apples red and the rest green.



What is the ratio of green apples to red apples?

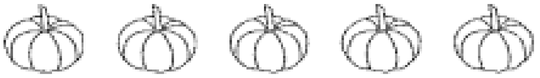
____

Name : ____________________   Score : ____________________

Ratio: Coloring Activity

Sheet 1

1) Color 3 pumpkins green and the rest orange.



What is the ratio of green pumpkins to orange pumpkins?

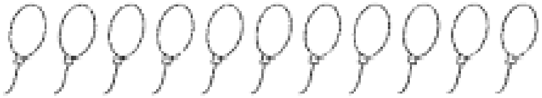
____

2) Color 5 hats blue and the rest pink.

What is the ratio of pink hats to blue hats?

____

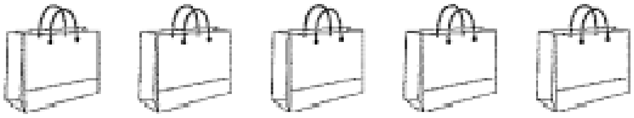
3) Color 6 balloons brown and the rest yellow.



What is the ratio of yellow balloons to brown balloons?

____

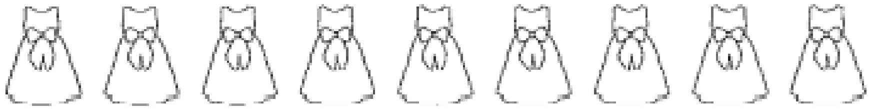
4) Color 4 paper bags red and the rest green.



What is the ratio of red paper bags to green paper bags?

____

5) Color 7 dresses violet and the rest blue.



What is the ratio of blue dresses to violet dresses?

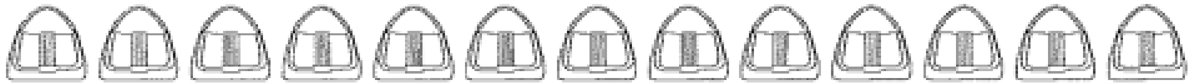
____

Name : ____________________ Score : ____________________

Ratio: Coloring Activity

Sheet 3

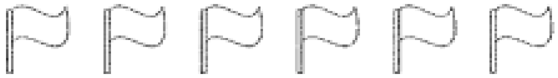
1) Color 9 handbags blue and the rest violet.



What is the ratio of blue handbags to violet handbags?

____

2) Color one flag yellow and the rest red.



What is the ratio of yellow flag to red flags?

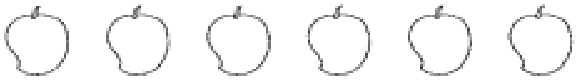
____

3) Color 7 balls pink and the rest blue.

What is the ratio of blue balls to pink balls?

____

4) Color 3 mangoes green and the rest yellow.



What is the ratio of yellow mangoes to green mangoes?

____

5) Color 5 cups orange and the rest pink.

What is the ratio of orange cups to pink cups?

____

Name : ____________________   Score : ____________________

Ratio in Three Ways: Part to Part

Sheet 1

1) Write the ratio of 17 balls to 2 bats in three ways.

Words	Ratio	Fraction

2) Write the ratio of 3 cats to 5 rats in three ways.

Words	Ratio	Fraction

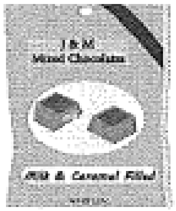
3) Write the ratio of 6 girls to 8 boys in three ways.

Words	Ratio	Fraction

4) Write the ratio of 11 cars to 20 bikes in three ways.

Words	Ratio	Fraction

5) A pack of mixed chocolates has 15 milk chocolates and 25 caramel filled chocolates. What is the ratio of milk chocolates to caramel filled chocolates? Write the ratio in three ways.



____

Name : ______________________ Score : ________________

Ratio in Three Ways: Part to Part

Sheet 2

1) Write the ratio of 16 cups to 12 saucers in three ways.

Words	Ratio	Fraction

2) Write the ratio of 22 candles to 15 matches in three ways.

Words	Ratio	Fraction

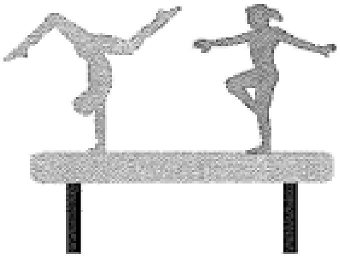
3) Write the ratio of 3 mattresses to 10 pillows in three ways.

Words	Ratio	Fraction

4) Write the ratio of 7 oranges to 13 bananas in three ways.

Words	Ratio	Fraction

5) There are 18 boys and 24 girls in a gymnasium academy. What is the ratio of girls to boys in the academy? Write the ratio in three ways.



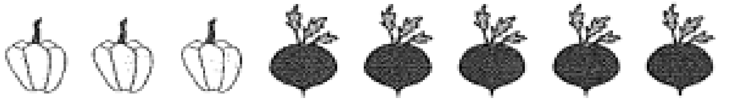
____

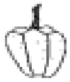
Printable Math Worksheets @ www.mathworksheets4kids.com

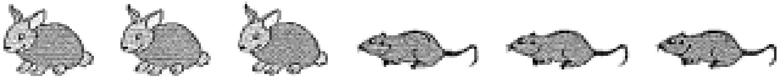
Name : ____________________ Score : ____________________

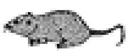
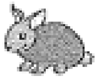
Ratio: Part to Part

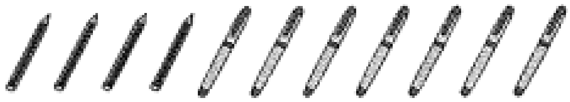
Level 1: S3

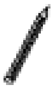
1) 

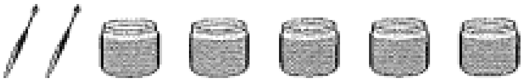
The ratio of  to  = ☐

2) 

The ratio of  to  = ☐

3) 

The ratio of  to  = ☐

4) 

The ratio of  to  = ☐

5) 

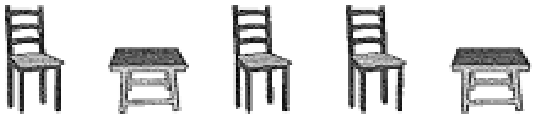
The ratio of  to  = ☐

Name : ____________________ Score : ________________

Ratio: Part to Whole

Level 1: S1

1)

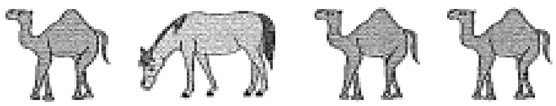


The ratio of chairs to furniture ______________

2)

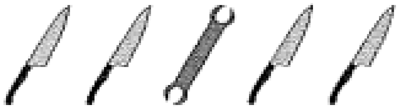
The ratio of pumpkins to vegetables ______________

3)



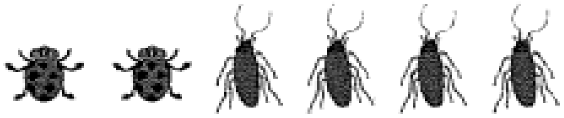
The ratio of animals to camels ______________

4)



The ratio of tools to knives ______________

5)

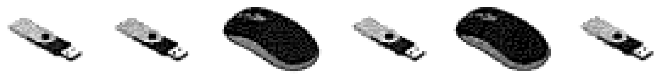


The ratio of ladybugs to insects ______________

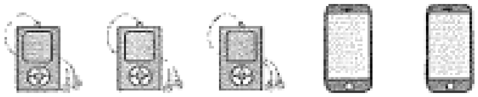
Name : ____________________ Score : ____________________

Ratio: Part to Whole

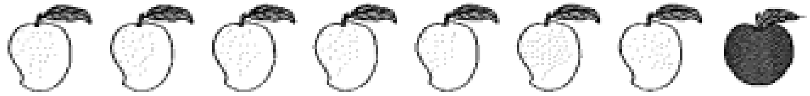
Level 1: S2

1) 

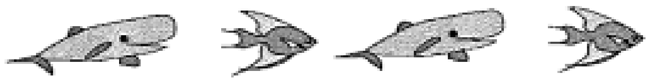
The ratio of flash drives to computer accessories ____________________

2) 

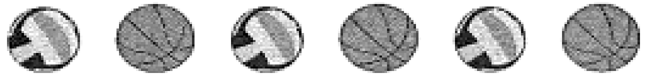
The ratio of gadgets to smartphones ____________________

3) 

The ratio of fruits to apples ____________________

4) 

The ratio of fish to aquatic animals ____________________

5) 

The ratio of balls to basket balls ____________________

August Math Pacing Guide
8th Grade

M.EE.8.NS.1 - Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.

Learning Goal:

- Level 2-3 – I will subtract fractions with like denominators (halves, thirds, fourths, and tenths) to solve a math problem.
- Level 1 – I will subtract fractional objects.

Essential Questions:

- How can I represent these fractions?
- What is the relationship between the two fractions?
- What is the difference of two fractions?
- Which part of the fractions do I subtract?
- Why do I not subtract the denominators?
- How can I express a fraction as a decimal?
- Which hundredths is larger/smaller (from a real-world example)?

Vocabulary:

- **numerator** - the top number in a fraction, which shows the number of parts of the whole taken.
- **denominator** - the bottom number in a fraction, which shows the number of parts the whole has been divided into.
- **equal** - alike in size, value or amount to something else.
- **fraction** - a representation of a division of a number; a part of a whole.
- **half** - either of two equal parts of something.
- **quarter** - one of four equal parts into which something is divided.
- **whole number** - a positive integer or zero. 1, 15, 30 and 894 are examples.

DYNAMIC®
LEARNING MAPS

Mini-Map for M.EE.8.NS.1

Subject: Mathematics
The Number System (NS)
Grade: 8

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.8.NS.1 Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.	**M.8.NS.1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate understanding of a subset by recognizing a subset as a set or group of objects within a larger set that share an attribute.	Recognize each object as the part of a whole or unit when shown a whole or unit containing a group of objects.	Communicate understanding that when fractional parts are added, it produces a larger portion of the whole, and that when fractional parts are separated, it results in a smaller portion of the whole. Decompose fractions into sums of unit fractions with the same denominator (e.g., 3/7 = 1/7 + 1/7 + 1/7).	Subtract two fractions with common denominators (e.g., 4/5 - 1/5 = 3/5).	Add or subtract two fractions where one fraction has a denominator of 10 and one has a denominator of 100 (e.g., 5/10 + 1/100 = 50/100 + 1/100 = 51/100).

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

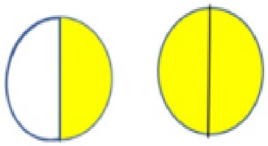
How is the Initial Precursor related to the Target?

Subtracting fractions requires a student to be able to recognize that two or more sets or groups of items exist. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or separated out. As educators present a set, they label it (e.g., two balls, one marker, three CDs), count the items, label it again, and encourage students to use numerals to label and count the separate sets. Use tools like the ten-frame to point out whole and parts (e.g., a set of 9 is part of 10).

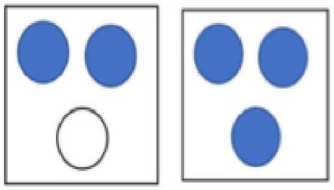
How is the Distal Precursor related to the Target?

As students work toward greater understanding of sets, educators will provide students with many set models (see below) of fractions using the same unit fraction, either halves, thirds, fourths, or tenths. Students will work on identifying the whole.

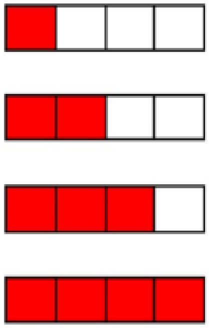
Unit Fraction 1/2



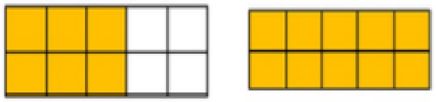
Unit Fraction 1/3



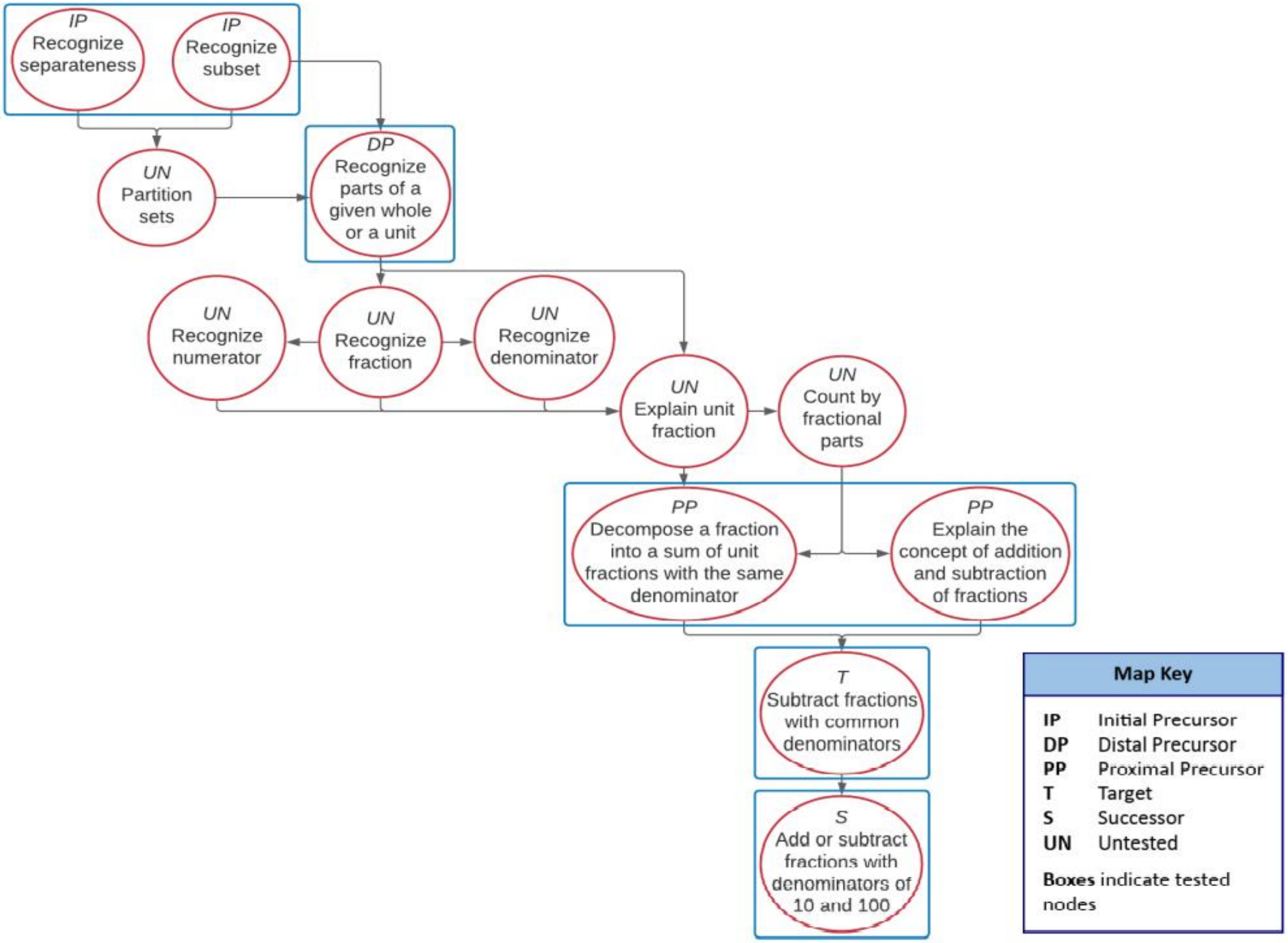
Unit Fraction 1/4



Unit Fraction 1/10



M.EE.8.NS.1 Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.



Rubric of Student Success

M.EE.8.NS.1 - Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.

Level 3 Students will… Successor and Target Students will…	Level 2 Students will… Proximal Precursor and Distal Precursor Students will…	Level 1 Students will… Initial Precursor Students will…
Level 3 Use objects or a model to subtract two fractional units (e.g., 3/4 cup – 1/4 cup is the same is 1/2 cup.	**Level 2** Model subtraction of two fractional units.	**Level 1** Select fractional units as part of a real-world problem or scenario.
Successor • Subtract fractions with denominators of 10 and 100 **Target** • Subtract fractions with common denominators	**Proximal Precursor** • Decompose a fraction into a sum of unit fractions with the same denominator • Explain the concept of subtraction of fractions **Distal Precursor** • Recognize parts of a given whole of a unit	**Initial Precursor** • Recognize separateness • Recognize subset

Instructional Ideas

M.EE.8.NS.1 - Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.

Division of whole into parts can be represented by fractions and decimals.

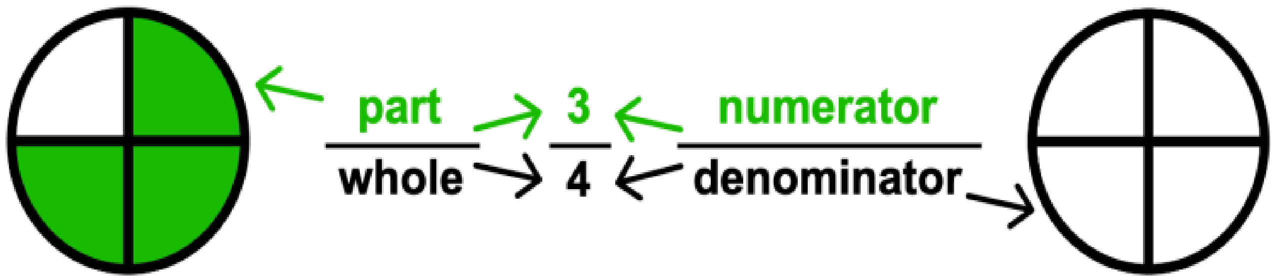
The big idea is that the concepts of subtraction are the same whether using whole numbers, fractions, or decimals.

- Introduce by asking the essential questions.
- Ask how many wheels does every bicycle have – 1 or 2? Discuss students' responses.
    - Discuss that a bicycle and the number of wheels it has represents a part-to-part ratio. For every 1 bicycle, there are 2 wheels. This is a ratio of 1 bicycle to 2 wheels. A ratio compares two numbers and describe a pattern. If there are two bicycles, then there are 4 wheels. Each time another bicycle gets added, 2 more wheels are added.
- Explain part-to-whole (total) ratio. A part-to-whole (total) ratio compares part of the total to the overall total. The part-to-whole (total) ratio of red markers to total markers is 1 to 8.
- Students will be modeling, writing, and matching ratios to describe a real-life relationship.
- Use manipulatives as needed.
- Provide students with their own ratio anchor chart.
- Included worksheets are examples of what to look for when finding additional materials that best fits your students needs.

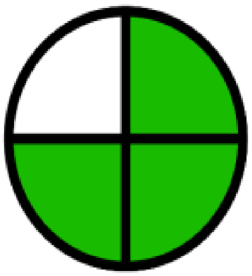
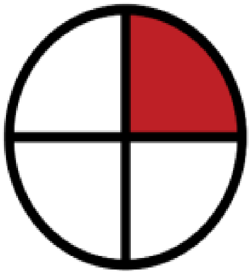
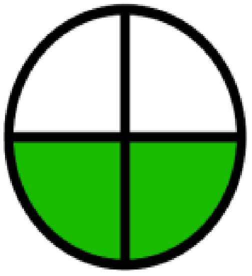
Additional Instructional Ideas

- Go to website for additional instructional resources, materials, and activities for lessons:
    - https://www.msnowakhomeroom.com/2a-fraction-unit.html

- Subtracting Fractions



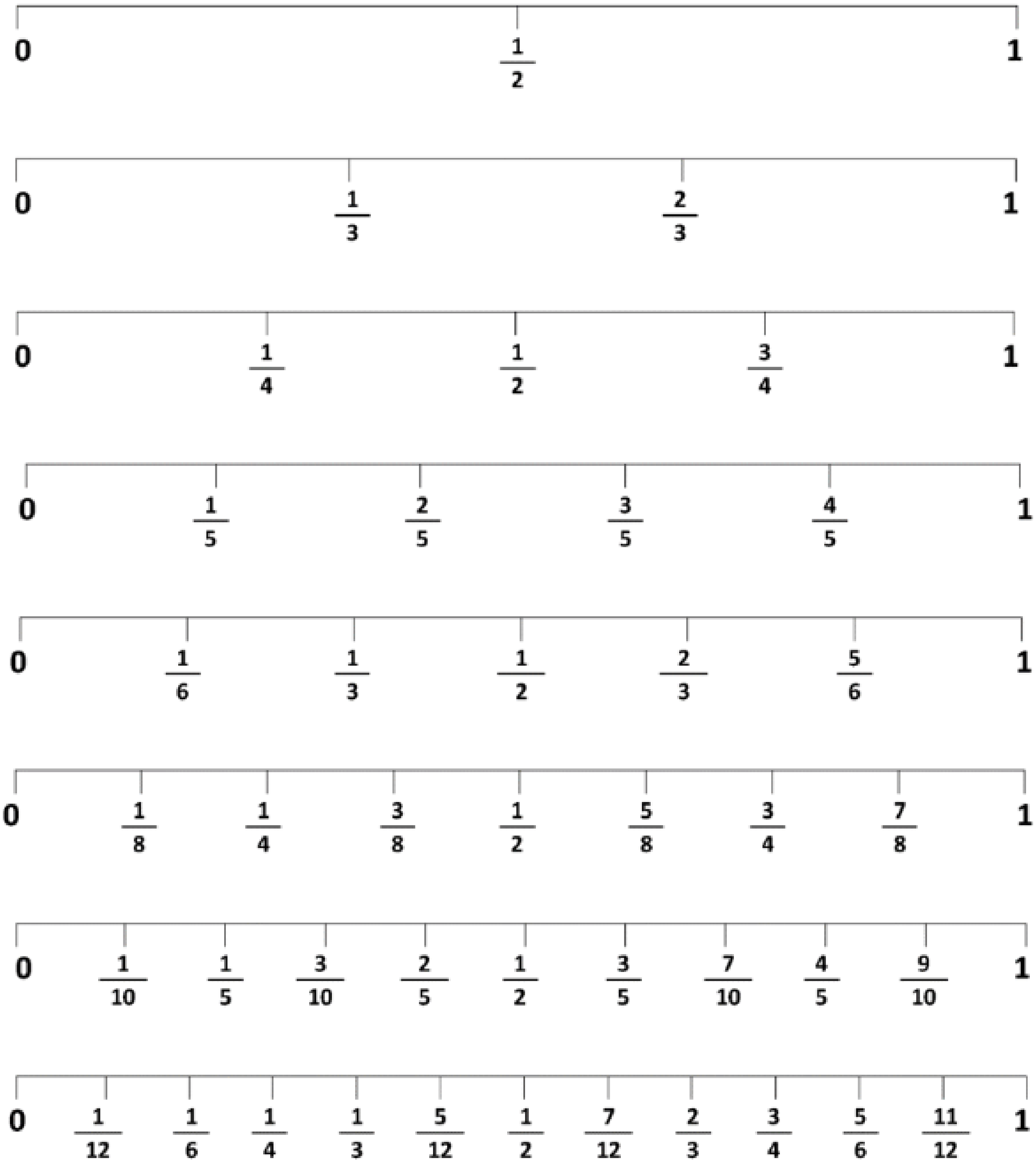
When the whole is divided into the same number, subtract the parts.

	-		=	
$\frac{3}{4}$	-	$\frac{1}{4}$	=	$\frac{2}{4}$

When the denominators are the same, keep the denominator and subtract the numerators.

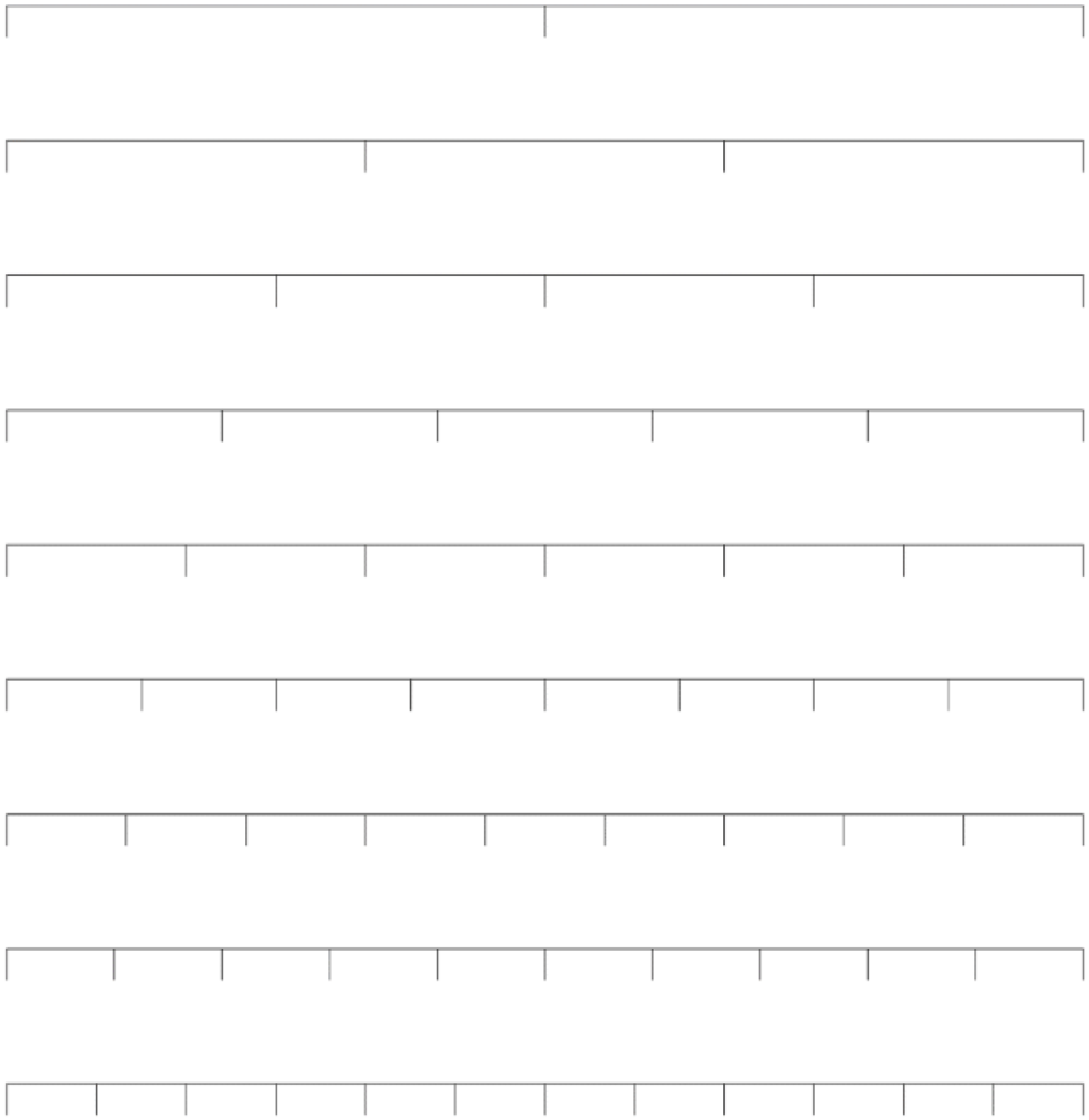
Name Date

FRACTION NUMBER LINES TO 1



Name Date

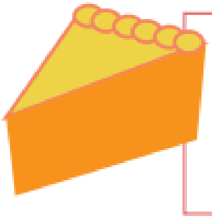
EMPTY FRACTION NUMBER LINES 0 TO 1



Math
Fractions

Subtracting Fractions
with the same denominator

Find the difference of each fraction equation below.
Remember: when subtracting fractions with the same denominator, simply subtract the numerators and keep the denominator the same.



numerator → 4
denominator → 6

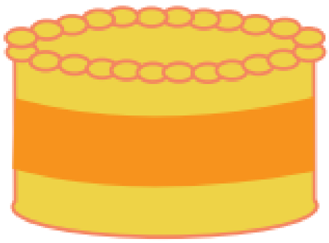
$$\frac{4}{6} - \frac{2}{6} = \frac{2}{6}$$

$\frac{7}{4} - \frac{3}{4} = \boxed{\quad}$ $\frac{6}{8} - \frac{1}{8} = \boxed{\quad}$

$\frac{5}{7} - \frac{4}{7} = \boxed{\quad}$ $\frac{8}{9} - \frac{3}{9} = \boxed{\quad}$

$\frac{2}{5} - \frac{2}{5} = \boxed{\quad}$ $\frac{10}{6} - \frac{8}{6} = \boxed{\quad}$

$\frac{34}{10} - \frac{13}{10} = \boxed{\quad}$ $\frac{23}{24} - \frac{12}{24} = \boxed{\quad}$



$\frac{58}{65} - \frac{14}{65} - \frac{2}{65} = \boxed{\quad}$

$\frac{107}{120} - \frac{16}{120} - \frac{9}{120} - \frac{29}{120} = \boxed{\quad}$

Student Name: ______________________________ **Score:**

Add or Subtract Like Fractions

E

$\frac{1}{2}+\frac{1}{2}=$ ☐ $\frac{5}{7}-\frac{2}{7}=$ ☐ $\frac{1}{6}+\frac{5}{6}=$ ☐

$\frac{2}{3}-\frac{1}{3}=$ ☐ $\frac{4}{9}+\frac{7}{9}=$ ☐ $\frac{6}{7}-\frac{3}{7}=$ ☐

$\frac{1}{4}+\frac{3}{4}=$ ☐ $\frac{4}{5}-\frac{2}{5}=$ ☐ $\frac{3}{8}+\frac{5}{8}=$ ☐

$\frac{6}{7}-\frac{4}{7}=$ ☐ $\frac{3}{5}+\frac{1}{5}=$ ☐ $\frac{3}{4}-\frac{1}{4}=$ ☐

$\frac{1}{8}+\frac{7}{8}=$ ☐ $\frac{5}{6}-\frac{1}{6}=$ ☐ $\frac{8}{9}+\frac{5}{9}=$ ☐

Fraction Math:
Addition and Subtraction

If the fractions both have the same denominator, it does not change.

Only add the top numerator.

$$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$$

This rule is the same for subtraction.

$$\frac{3}{4} - \frac{1}{4} = \frac{2}{4} \begin{array}{l} \leftarrow \text{numerator} \\ \leftarrow \text{denominator} \end{array}$$

Add or subtract the problems below.

$\frac{2}{4} + \frac{1}{4} =$ $\quad\frac{4}{8} + \frac{2}{8} =$ $\quad\frac{2}{3} - \frac{1}{3} =$

$\frac{3}{7} + \frac{2}{7} =$ $\quad\frac{5}{6} - \frac{1}{6} =$ $\quad\frac{4}{9} + \frac{3}{9} =$

$\frac{4}{5} - \frac{1}{5} =$ $\quad\frac{6}{7} - \frac{1}{7} =$ $\quad\frac{4}{12} + \frac{2}{12} =$

$\frac{4}{10} + \frac{1}{10} =$ $\quad\frac{8}{16} + \frac{2}{16} =$ $\quad\frac{2}{20} + \frac{7}{20} =$

$\frac{6}{15} + \frac{2}{15} =$ $\quad\frac{10}{18} - \frac{2}{18} =$ $\quad\frac{4}{10} + \frac{2}{10} =$

$\frac{10}{25} + \frac{5}{25} =$ $\quad\frac{6}{30} + \frac{7}{30} =$

September Math Pacing Guide
6th Grade

1. **M.EE.6.NS.1** - Compare the relationships between two unit fractions.

    - Go back to pages 7 – 26 to see content for this standard.

2. M.EE.6.NS.5-8 - Understand that positive and negative numbers are used together to describe quantities having opposite directions or values.

Learning Goal:

- Level 2-3 – I will add positive and negative numbers to solve a math problem and graph the answer.
- Level 1 – I will count objects with negative numbers.

Essential Questions:

- Where can I find this number on a number line?
- Does this number have a positive or negative value?
- What are some examples I can use to show negative and positive numbers?
- If I start with a positive number and then add a negative number, what direction on the number line will I move?
- How far is this number from zero?

Vocabulary:

- **Positive numbers -** numbers greater than zero; the numbers to the right of zero on the number line.
- **Negative numbers –** numbers that are less than zero; the numbers to the left of zero on the number line.
- **Whole number** - a positive integer or zero. 1, 15, 30 and 894 are examples.
- **Number line -** visual representation of numbers along a horizontal line.

DYNAMIC®
LEARNING MAPS

Mini-Map for M.EE.6.NS.5-8

Subject: Mathematics
The Number System (NS)
Grade: 6

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.6.NS.5-8 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero).	**M.6.NS.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. **M.6.NS.6** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. **M.6.NS.7** Understand ordering and absolute value of rational numbers. **M.6.NS.8** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate understanding of set by recognizing a group of objects sharing an attribute.	Count all objects in a set to communicate the total number of objects in that set. Identify sets having the same number of objects. Identify a set containing a different number of objects than the other two sets. Recognize a set containing more or fewer objects than the other set.	Communicate understanding that opposite numbers are equidistant from zero but in opposite directions, or that when two opposite numbers are added together they yield a sum of zero (e.g., 3 + (- 3) = 0, thus 3 and -3 are opposite numbers).	Demonstrate use of positive and negative numbers in real-world contexts such as temperature, elevation, credits, and debits (e.g., representing a debit of 500 dollars as -500 dollars).	Communicate understanding of inequalities in real-world contexts (e.g., -3 degrees > -7 degrees means that -3 degrees is warmer than -7 degrees). Communicate the meaning of zero in relation to positive and negative numbers in real-world contexts (e.g., recognize that no elevation, or 0 feet, means "at sea level"; positive elevation, for example, 200 feet, means "above sea level"; and negative elevation, for example, -200 feet, means "below sea level").

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

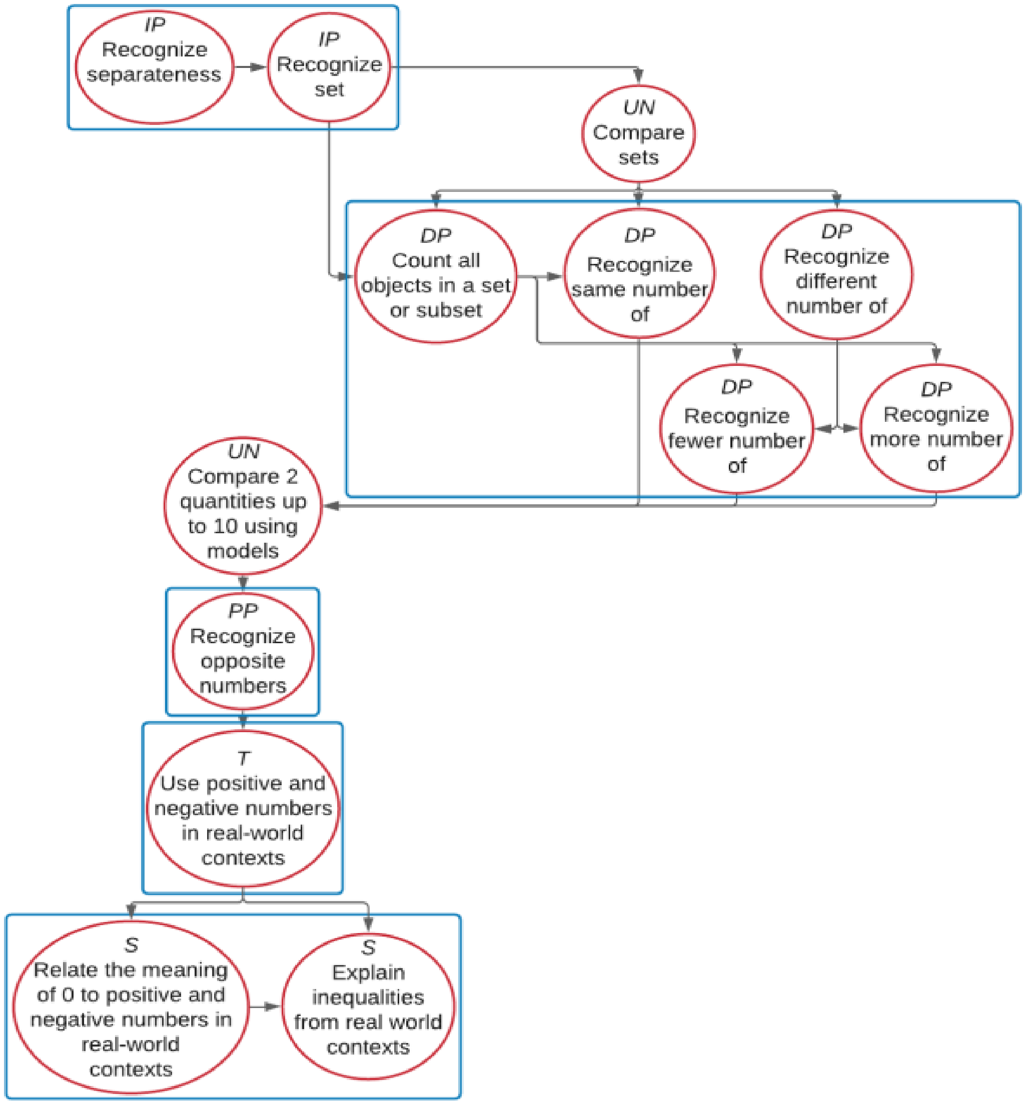
How is the Initial Precursor related to the Target?

In order to use positive and negative numbers, students need to gain experience with creating sets. Educators can help students learn this by providing students with opportunities to take a set of objects (e.g., tiles, linking cubes, buttons) and separate them based on a given characteristic (e.g., shape, color, size) into two distinct sets. Then encourage them to separate them again based on another characteristic.

How is the Distal Precursor related to the Target?

As students begin to develop the understanding of sets and numbers, educators will highlight the differences between sets on the basis of overall area or discrete number using the words same, different, fewer and more. Provide students with multiple opportunities to count and compare a wide variety of sets with an increasing number of items, label the set (e.g., eight ball, 12 bears, 15 blocks), and move items in and out of the sets, labeling and counting them again (e.g., "You just said this set has 11 cubes; if I take two cubes, how many will you have?").

M.EE.6.NS.5-8 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero).



Map Key

IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Rubric of Student Success

M.EE.6.NS.5-8 - Understand that positive and negative numbers are used together to describe quantities having opposite directions or values.

Level 3 Students will… Successor and Target Students will…	Level 2 Students will… Proximal Precursor and Distal Precursor Students will…	Level 1 Students will… Initial Precursor Students will…
Level 3 Identify and label positive and negative numbers in the context of a real-world scenario. Use appropriate operations to add and subtract positive and negative numbers in a real-world scenario (using a number line). Independently identify the opposite of a number and the number equals 0 (e.g., -2 and 2, -2 + 2 = 0).	**Level 2** Select positive and negative numbers in a real-world scenario. Add or subtract positive and negative numbers in a real-world scenario (e.g., using a number line). Select the opposite of a number (e.g., -2 and 2, -2 + 2 = 0).	**Level 1** Participate in labeling positive and negative numbers using an active response mode. Count a set of objects in an addition or subtraction real-world problem involving positive and negative numbers through an active participation response (e.g., voice output device, eye gaze choice board.). Participate in labeling the opposite of a number (e.g., -2 and 2, -2 + 2 = 0).
Successor • Relate the meaning of 0 to positive and negative numbers in real-world context	**Proximal Precursor** • Recognize opposite numbers	**Initial Precursor** • Recognize separateness • Recognize set

• Explain inequalities from real-world contexts **Target** • Use positive and negative numbers in real-world contexts	**Distal Precursor** • Count all numbers in a set or subset • Recognize same number of • Recognize differ number of • Recognize few number of • Recognize more number of	

Instructional Ideas

M.EE.6.NS.5-8 - Understand that positive and negative numbers are used together to describe quantities having opposite directions or values.

Both positive and negative numbers represent a distance from zero on the number line.

The big idea is that positive numbers are greater than zero. Negative numbers are less than zero and have a negative sign (-) in front of them. A negative number is the opposite of a positive number of the same size.

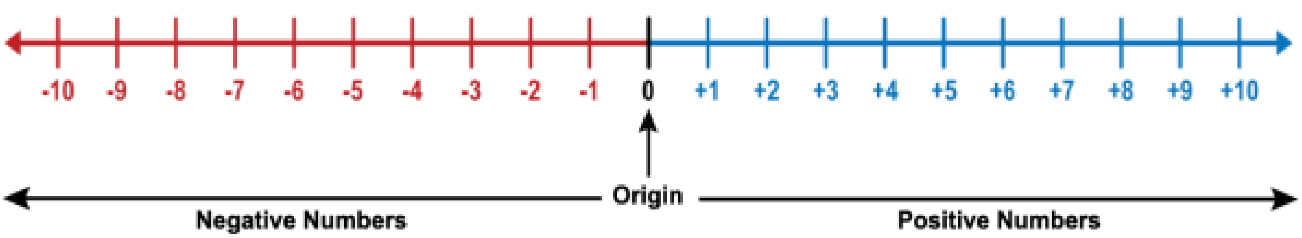
- Introduce by asking the essential questions.
- Display a minus sign and ask, "What does this sign mean besides subtract – negative or positive?" Discuss students' responses.
- Introduce and discuss the symbols used to indicate a negative and positive number, including the minus sign and the plus sign.
- Discuss the uses of a negative number in temperature, seal level, and when owing money.
- Tell students it is their job to count, add negative and positive numbers, and graph the numbers on a number line.
- Remind students that when they see a minus sign, or negative sign, it means that the number is less than zero.
- Model the steps of graphing a positive and negative number on a number line.
- Model how to write positive and negative numbers with the appropriate sign in front of it.
- Model the steps of solving the problem using the number line.
- Solve the problem by counting in the targeted direction.
- Use manipulatives as needed.
- Students may use a calculator if needed.
- Provide students with their own number line and anchor chart.
- Included worksheets are examples of what to look for when finding additional materials that best fits your students needs.

Additional Instructional Ideas

- Go to website for additional instructional resources, materials, and activities for lessons:
    - https://www.msnowakhomeroom.com/2e-positivenegative-numbers.html

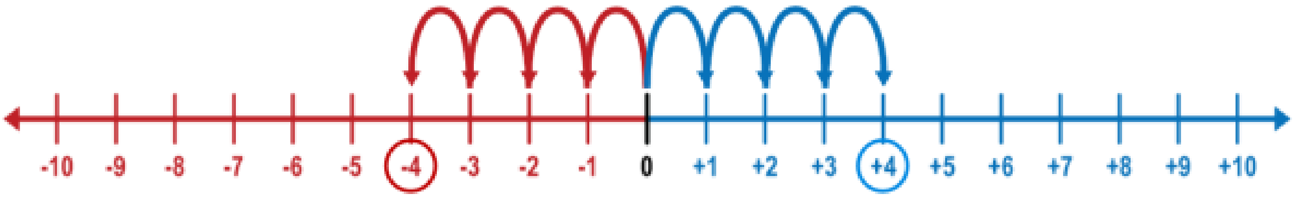
+ - Positive and Negative Numbers

Zero is the middle of all numbers.
Zero has no value. All **negative** numbers are to the **left** of **zero.**
All **positive** numbers are to the **right** of **zero.**



Numbers that are **equal** distance from **zero** are **opposites.**

For example, -4 and +4 are **opposites** because they are both 4 units from zero.



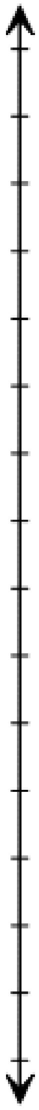
Adding opposite numbers will always equal **zero.**
For example, +4 + -4 = 0 or -4 + +4 = 0

Positive and Negative numbers describe opposite relationships:

Positive is opposite of Negative
Up is opposite of Down
Above is opposite of Below
How much you **have** is opposite of How much you **owe**

①

②



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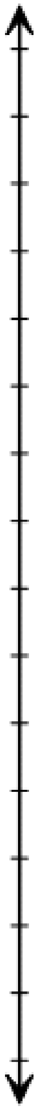

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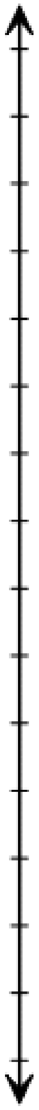
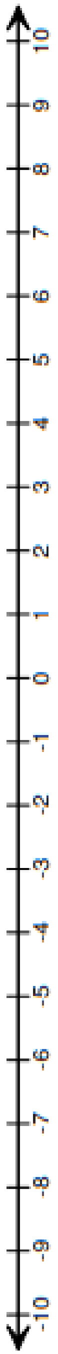


Math Worksheets and Teacher Resources @ http://www.mathworksheets4kids.com

①


-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

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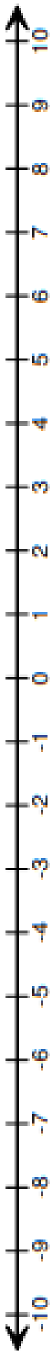
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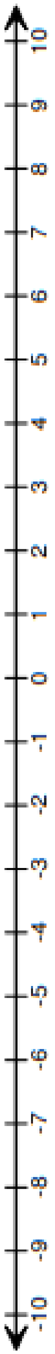
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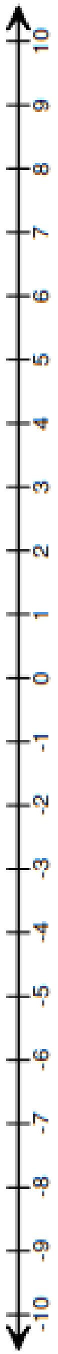
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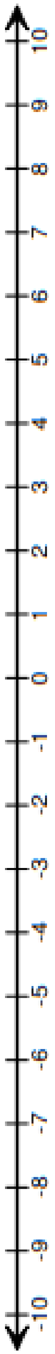
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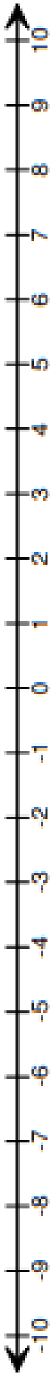
1)



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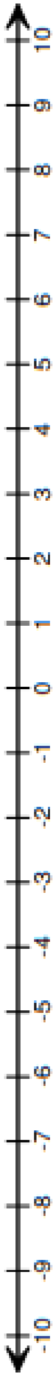


3)

4)

5)

6)

7)

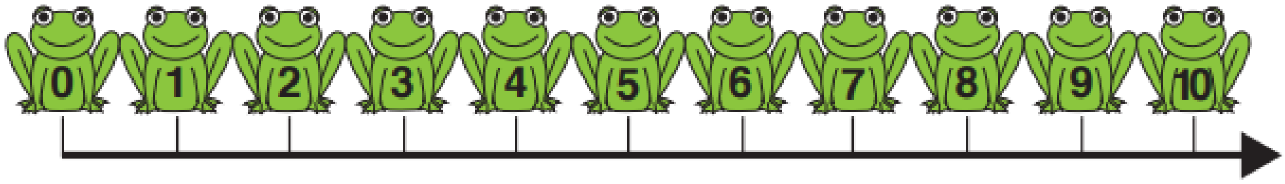
8)

9)

10)

Number Line

Use the number line to find the answer to each problem. Look at the first number in the problem. Put your pencil on that number on the number line. Look at the second number in the problem. Move your pencil to the right that many numbers on the number line to find the answer.



① 4+2=_____

② 0+5=_____

③ 1+6=_____

④ 7+3=_____

⑤ 5+4=_____

⑥ 1+9=_____

⑦ 8+2=_____

⑧ 4+0=_____

⑨ 6+3=_____

⑩ 3+3=_____

⑪ 2+3=_____

⑫ 2+7=_____

education.com

Student Name: ______________________________ **Score:**

Addition Using Number Line

Draw hops to show the addition sentence and find the sum.

1)

1 + **3** = ☐

2)

2 + **2** = ☐

3)

3 + **2** = ☐

4)

1 + **1** = ☐

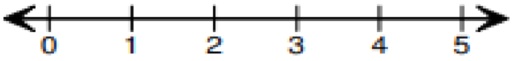
5)

2 + **1** = ☐

6)

3 + **1** = ☐

7)



1 + **4** = ☐

8)

2 + **3** = ☐

Name: ____________________________ Date ______________

Topic: Representing Integers- Worksheet 1

Represent the statements with integers.

1 Forty-eight feet below sea level.

2 The opposite of -768

3 A pay cut of $14,000.

4 The stock market went up 1,400 points today.

5 The football player had a 60 yard gain on the play.

6 60^0 below zero.

7 The opposite of -974

8 A loss of thirty pounds.

9 A raise of $14,450.

10 Ninety-five feet below sea level.

Student Name: ______________________ **Score:**

Opposite of Integers

Write the opposite of the integers: (The first one is done for you)

Opposite of 3	**-3**
Opposite of −4	
Opposite of −9	
Opposite of 6	
Opposite of 4	
Opposite of −1	
Opposite of 9	
Opposite of −2	
Opposite of 1	
Opposite of −8	
Opposite of −3	
Opposite of 2	
Opposite of −5	
Opposite of 7	
Opposite of −6	
Opposite of −3	

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Student Name: ______________________ **Score:**

Representation of Integers

Reperesent the following statement as integers: (The first one is done for you)

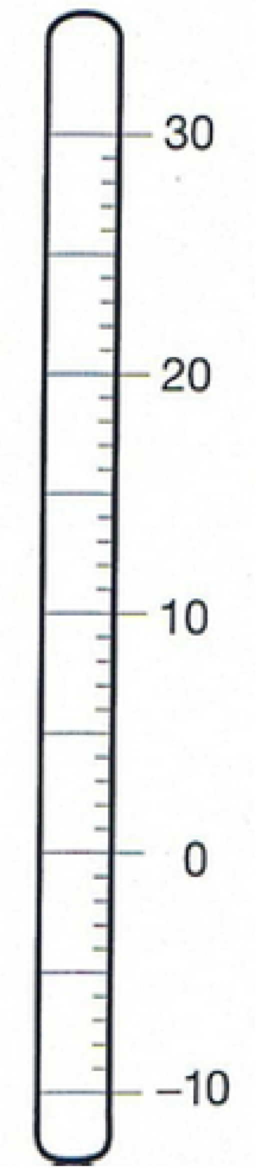
Statement	Integer
Rony earned $ 5	+5
The tempreature falls 10 degrees	
Tim won 20 points	
Jack lost forty dollars	
The plant has grown 3 inches since last month	
Thomas has to pay $ 4 as penalty	
The cat lost its two kittens	
Rosy have 12 excessive stamps compared to others	
Henry won a lottery amount of $ 50	
Andy got 7 set of watches as gift	
Zack lost a pound since last month	

Temperature:

The table displays the low temperatures that occurred in North Dakota during a week last winter.

Day:	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Low Temperature in °F	8°	-2°	-4°	-6°	0°	-3°	-8°

1. Mark and label the temperatures from that week.

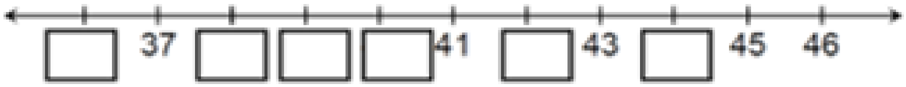


Put the temperatures in order from coldest to warmest:

Number Line Practice:

Directions: Fill in the missing numbers on each number line.

1.



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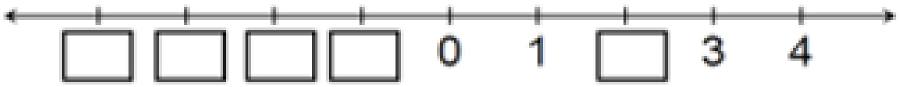

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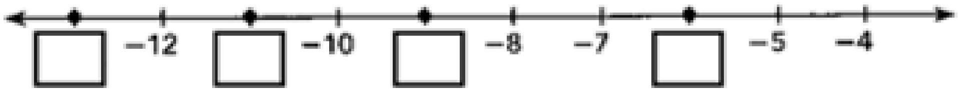

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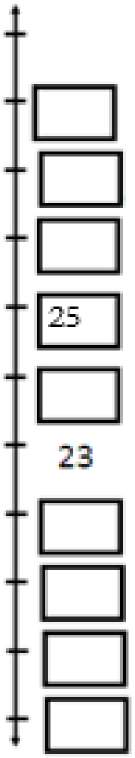

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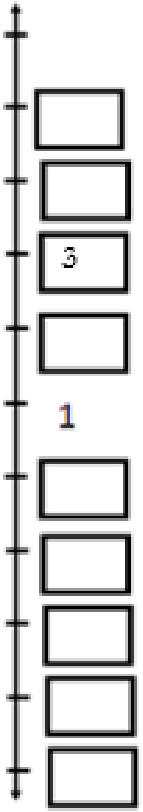

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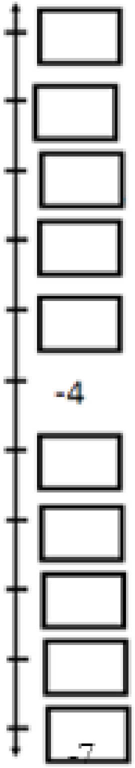
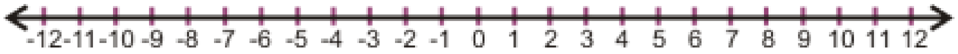


Name: ___________________________ Date ______________

Topic: Positive/Negative Number Line Addition - Worksheet 1

Directions: Complete the following operation using the number lines.

1 2+2



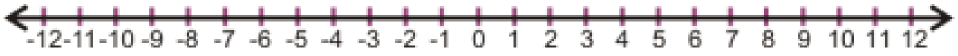
2 5-2

3 -6-4

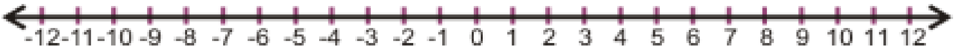
4 6+2

5 9-2

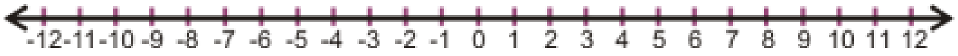
6 4+2



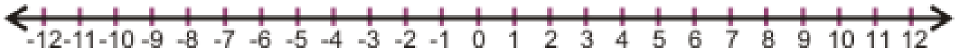
7 1+6



8 -8+2



9 7+1

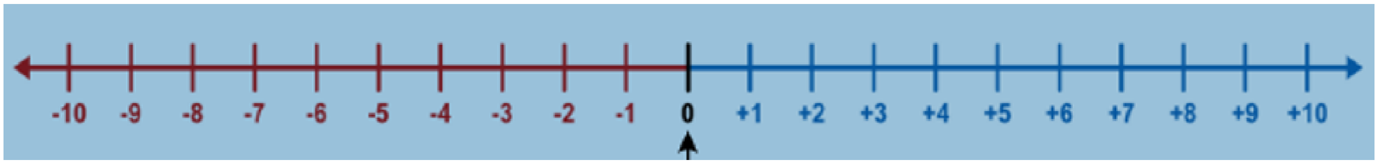


10 3+4

Name ____________________________

Date _________________

Number Line



Word Bank

Down **Giraffe** **Below** **Right** **How much you owe** **Left** **Negative**

1. **Positive** is opposite of ___________________________.
2. **Up** is opposite of _____________________________.
3. **Above** is opposite of ___________________________.
4. **How much you have** is opposite of ____________________________________.
5. **Positive** numbers are to the ________________ of zero (0).
6. **Negative** numbers are to the _______________ of zero (0).

September Math Pacing Guide
7th Grade

M.EE.7.NS.1 - Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one.

- Go back to pages 7 – 26 to see content for this standard.

M.EE.7.RP.1-3 - Use a ratio to model or describe a relationship.

- Go back to pages 39 – 59 to see content for this standard.

September Math Pacing Guide
8th Grade

<u>M.EE.8.NS.1</u> - Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.

- Go back to pages 60 – 71 to see content for this standard.

Credits

Websites Used for Worksheets and Lesson Ideas:

- https://www.education.com
- https://www.twinkl.com
- https://www.superteacherworksheets.com
- https://www.easyteacherworksheets.com
- https://www.mathworksheets4kids.com
- https://www.math-salamanders.com
- https://www.math-drills.com

Resources Used to Help Create the Pacing Guide:

DLM Essential Elements Unpacking

- https://www.dlmpd.com/dlm-essential-elements-unpacking

Instructional Resources for YE Model States

- https://dynamiclearningmaps.org/instructional-resources-ye/mathematics

Dynamic Learning Maps

- https://dynamiclearningmaps.org

Unique Learning System

- https://www.n2y.com/unique-learning-system