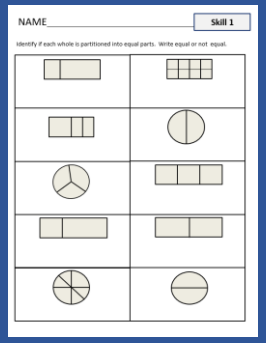
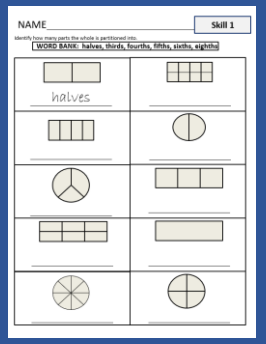
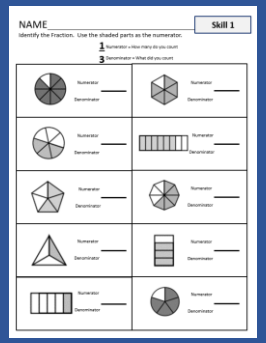
Skill 1

Formative Assessments







Identifies Basic Fractions: Part of a Whole and Part of a Set

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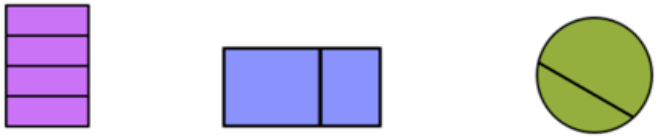
Domain 1

The entire concept of what is a fraction is directly connected to understanding what is one whole.



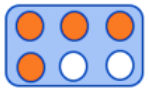
Understand a fraction has to be partitioned into equal pieces. Develop language of halves, thirds, fourths, etc.

Part of a Whole Part of a Set

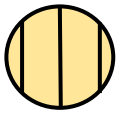
Common Misconceptions:

Student will view the numerator and denominator independent of each other.

" One – Third (1/3) is shaded in because 1 piece is shaded in and 3 are not, so 1/3 is shaded."



" Four halves (4/2) are shaded because there are 4 orange circles and 2 white circles."



Student will exclusively focus on the number of pieces, but not if the pieces are equal.

" The whole fraction is in fourths because there are four pieces"

Avoid the phrase "Out of"

.

"3 out of 4" can imply 3 wholes out of 4 wholes."

"If a fraction is two whole numbers, is 3 chips out of 8 greater than 1 chip out of 2? Therefore 3/8 > 1/2.

"Does 6/5 mean you take 6 parts out of 5"

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Skill 1: Activity 1

Objective:

- For students to understand the word “Fraction” means a quantity divided into parts.
- Understand fair shares or sharing and equal parts.
- Real world connections for fractions

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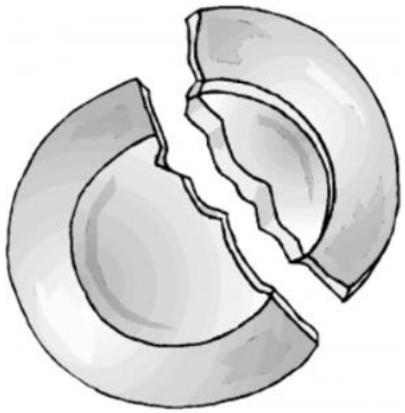
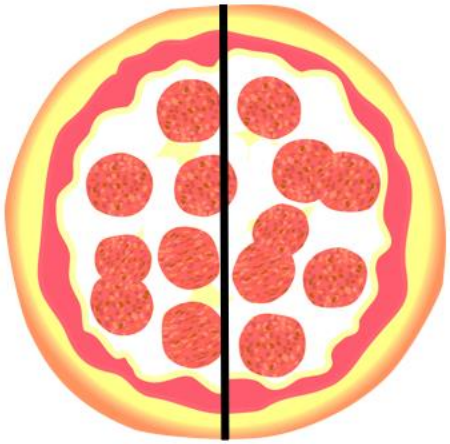
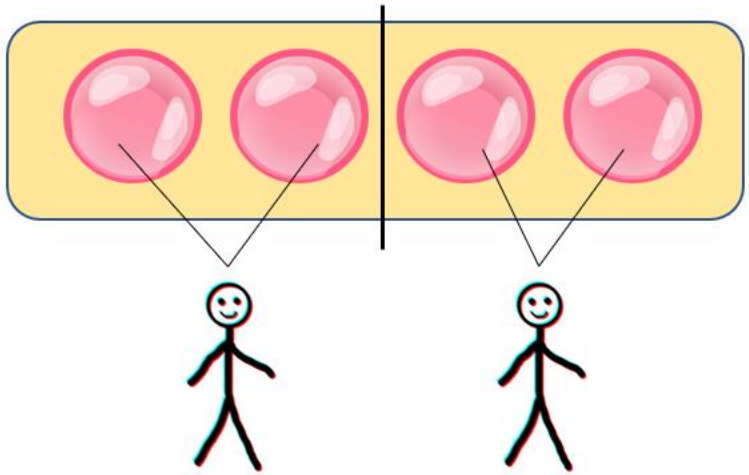
Fractured Leg



Fractured Plate



Fair Sharing a Whole



Fair Sharing a Set

Skill 1: Activity 1

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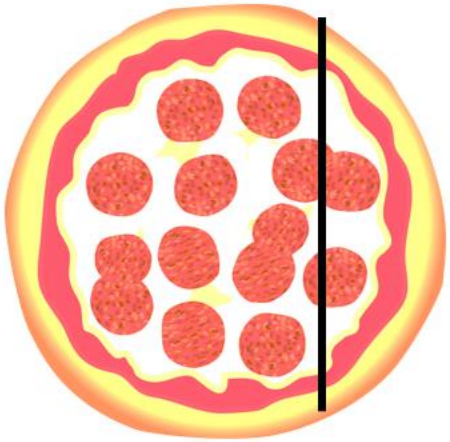

Not Fair Sharing

Skill 1: Activity 2

Objective:

- For students to identify and differentiate between equal parts and not equal parts.
- Once the concept of equal parts has been established, introduce the proper language that will be used to identify wholes that are partitioned into equal parts.
- Fourths not fours…. Thirds not Threes…. Halves not Twos

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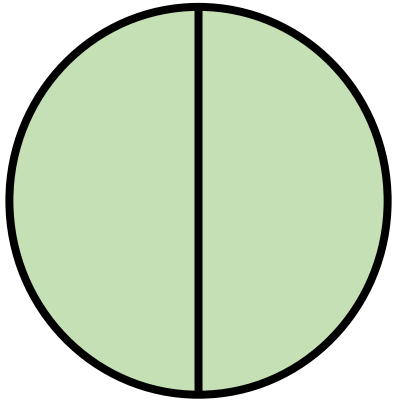
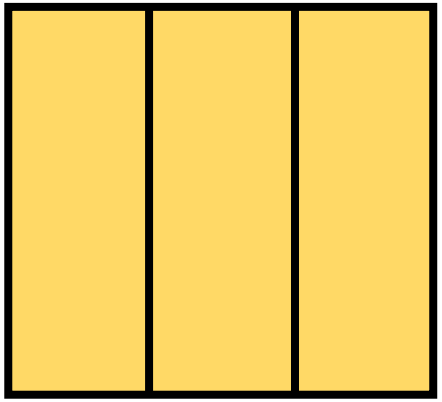
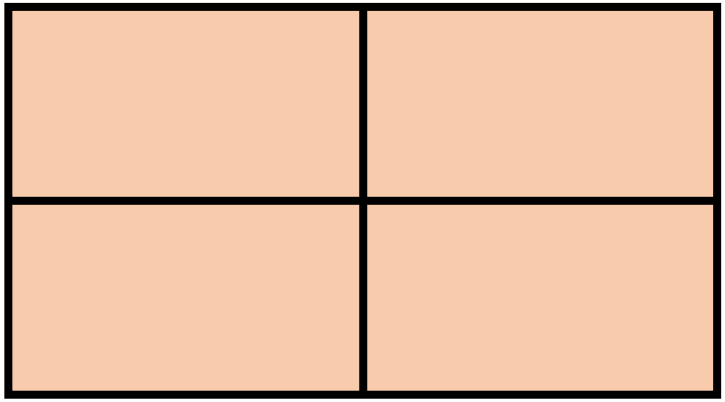
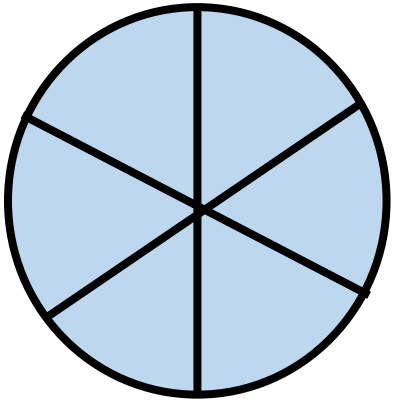
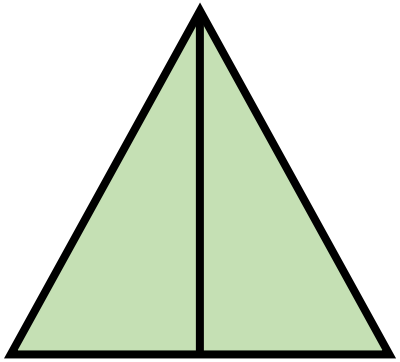
Skill 1: Activity 2

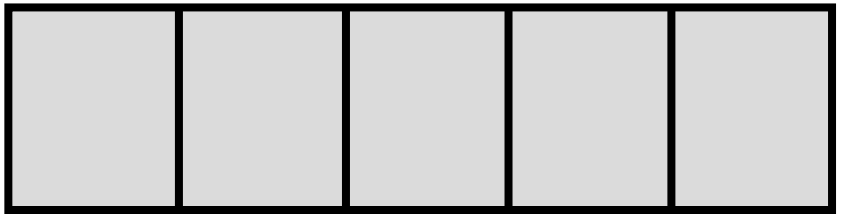






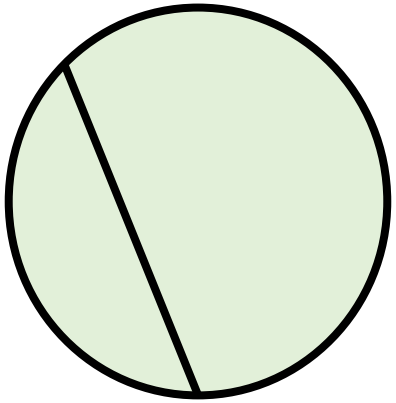


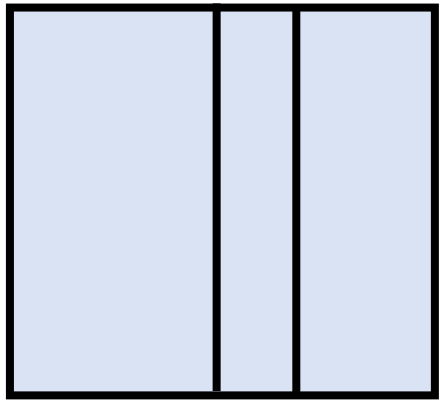


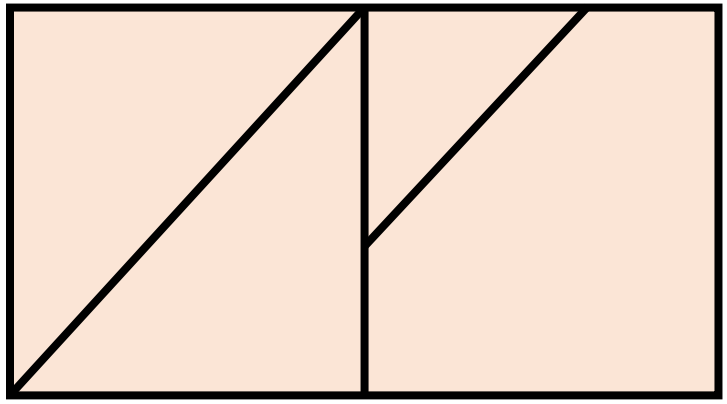


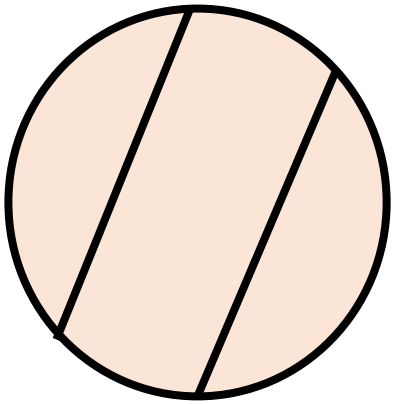
Equal Parts	Not Equal Parts

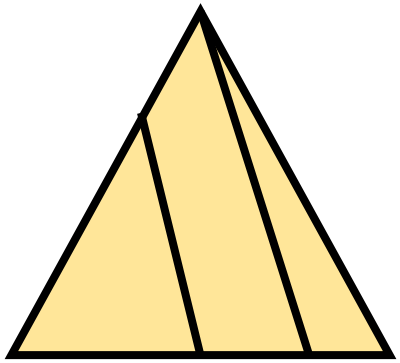
Skill 1: Activity 2

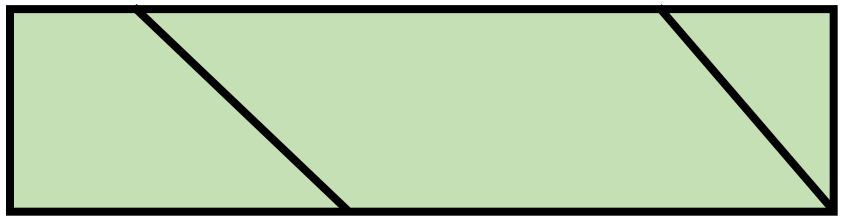












Halves

Thirds

Fourths

Fifths

Sixths

~~Twos~~

Skill 1: Activity 3

Objective:

- For students to understand how to partition based on fractional language.
- Introduce students to algorithmic halving and partitioning oddness.
- " Divide or partition the rectangle into halves."
- " Partition the circle into fourths"

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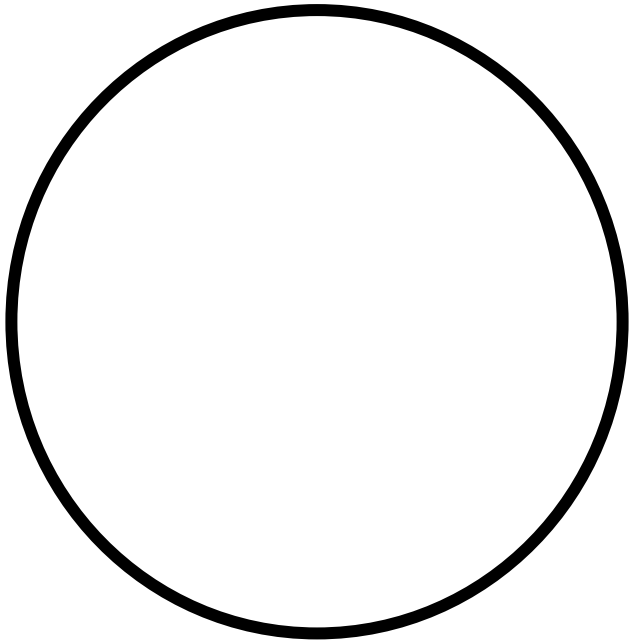
Skill 1: Activity 3



Equal Parts Not Equal Parts

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Skill 1: Activity 4

Objective:

- For students to learn the proper way to write a whole in the form of a fraction by using a numerator and denominator.

- For students to expand their knowledge of writing one whole in the form of a fraction to writing fractions less than one with a numerator and denominator.

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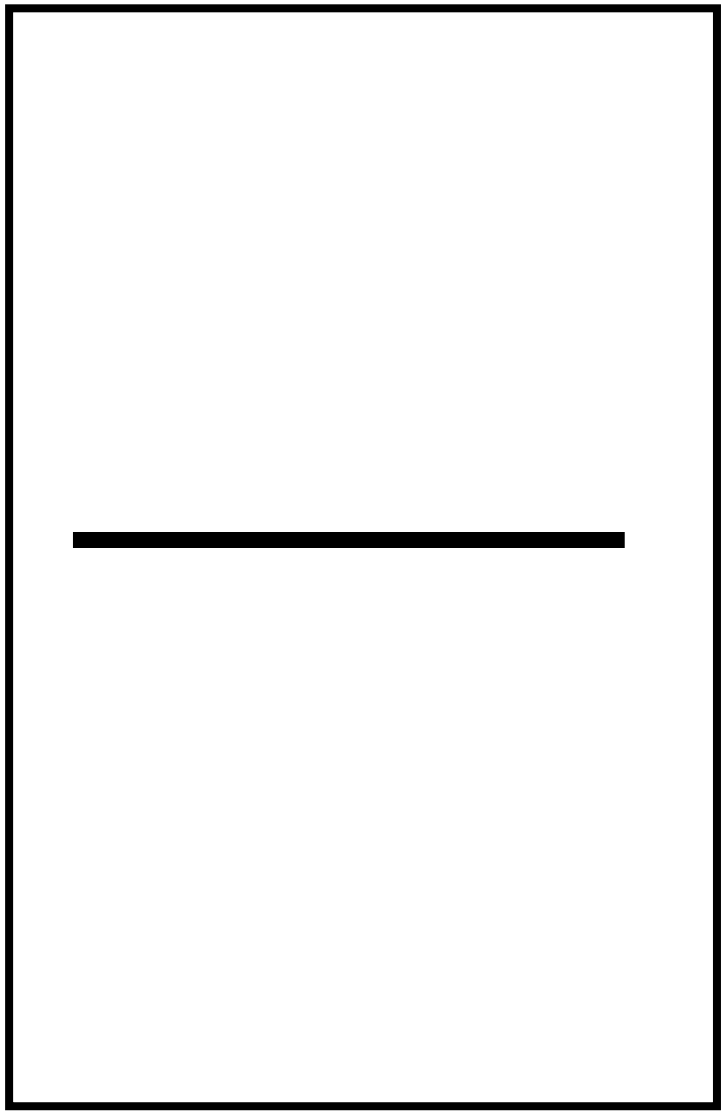
Skill 1: Activity 4

Numerator: How Many Did You Count



Denominator: What Did You Count

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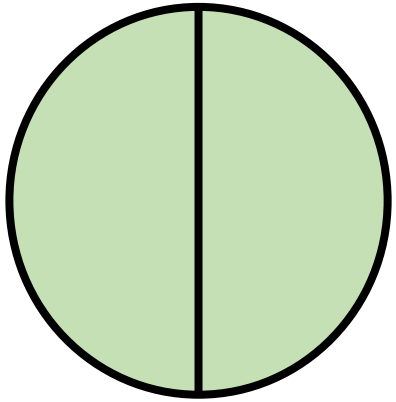
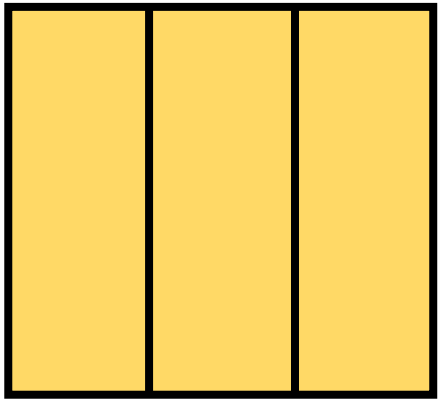
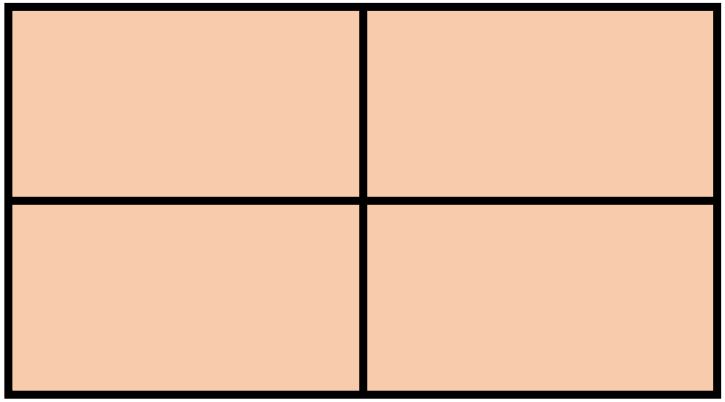
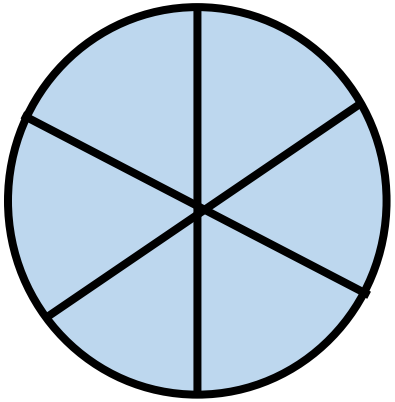
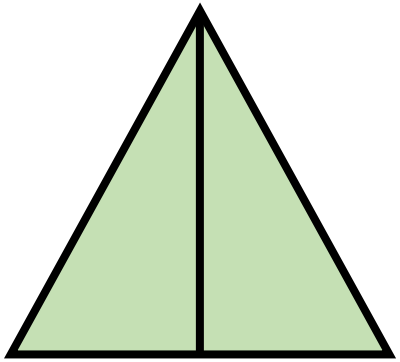
Skill 1: Activity 4

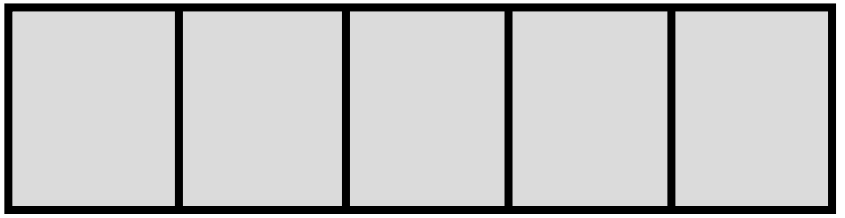


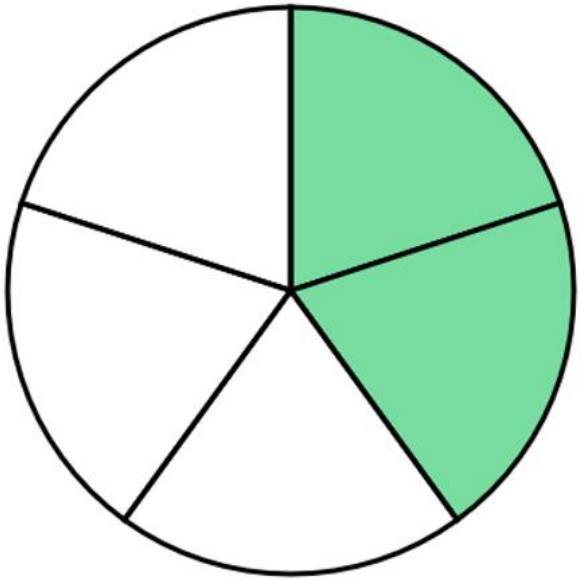


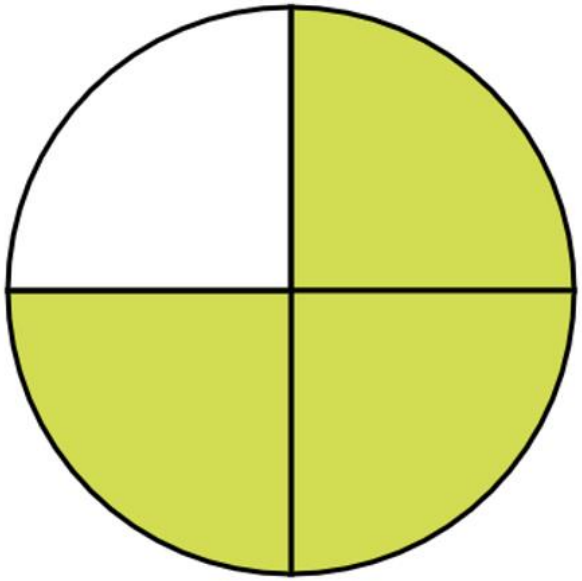


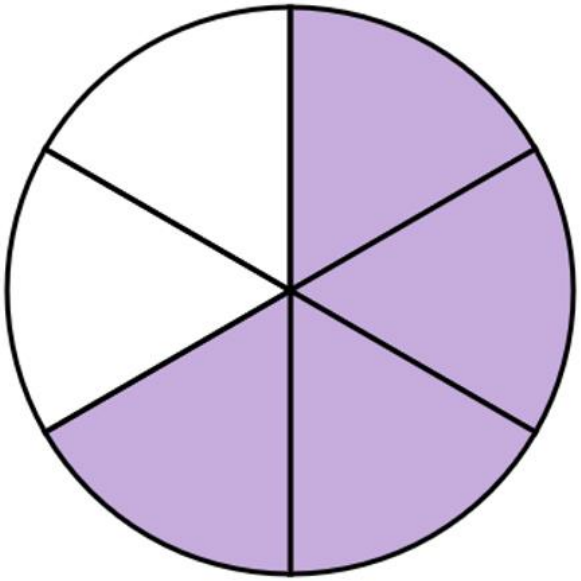




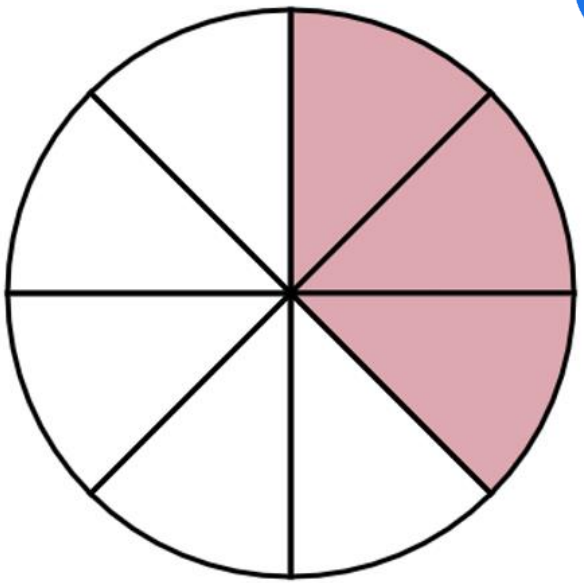


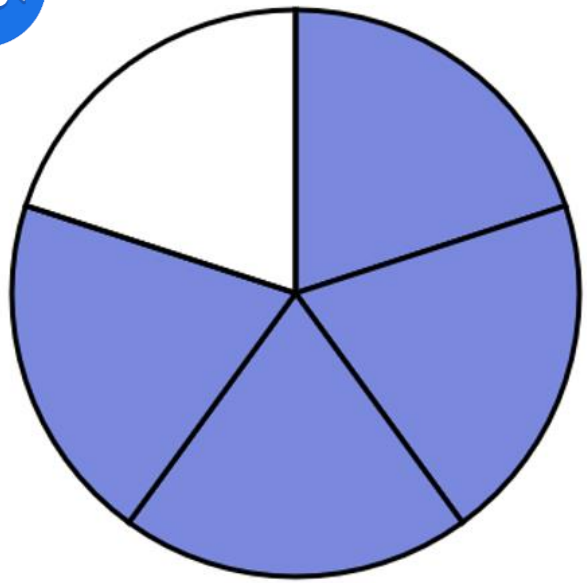


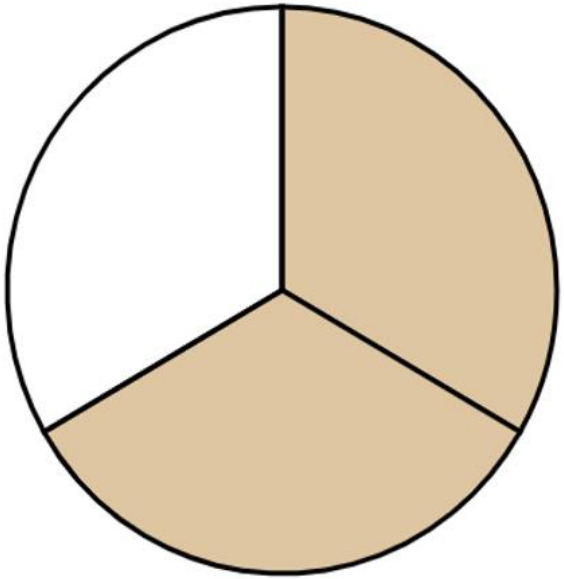




Skill 1: Activity 4

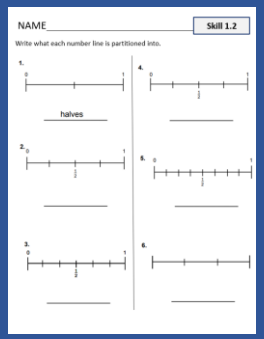


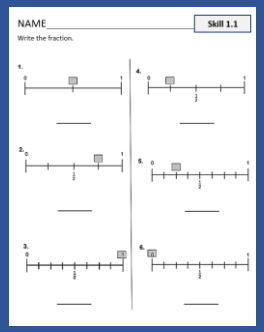


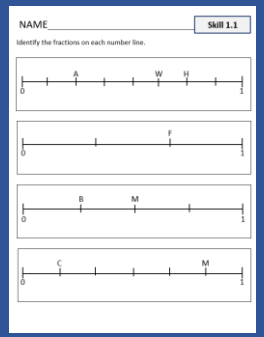


Skill 1.1

Formative Assessments





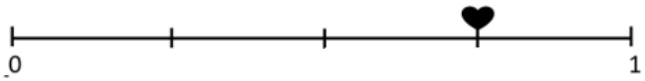


Identifies Fractions on a Number Line

Numeracy Consultants LLC

Domain 1

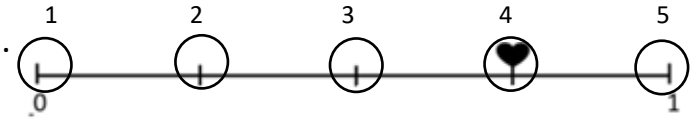
98% of 3rd graders could shade ¾ of a unit whole, only 31% could find ¾ of a number line (Payne 1984)



Identify a fraction on a number line with preexisting partitions.

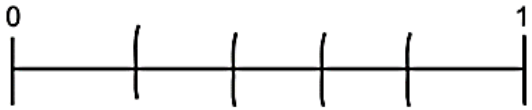
Place a fraction on an open number line with no partitions. Requires knowledge of partitioning, algorithmic halving, partitioning oddness, and visualization.

Common Misconceptions:



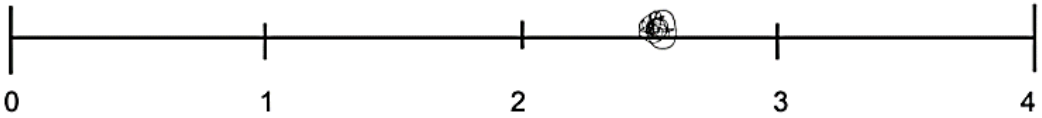
Student will count hashes instead of viewing it as a measurement between hashes. " 4/5 is shaded"

When students partition a number line into fourths, they will draw four lines instead of three lines.



When students locate fractions on a number line they use their knowledge of whole numbers.

Draw a dot where 2/3 would go.



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Skill 1.1: Activity 1

Objective:

- To expand a student's knowledge of fractions from part of a whole (area models) and part of a set to a number line.
- To identify a fraction on a partitioned number line.
- To place a fraction on a number line that is not partitioned.

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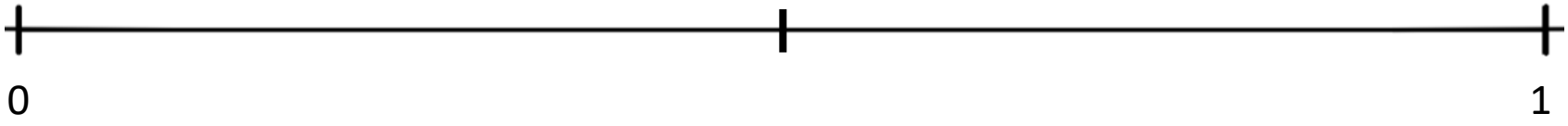
Skill 1.1: Activity 1

A



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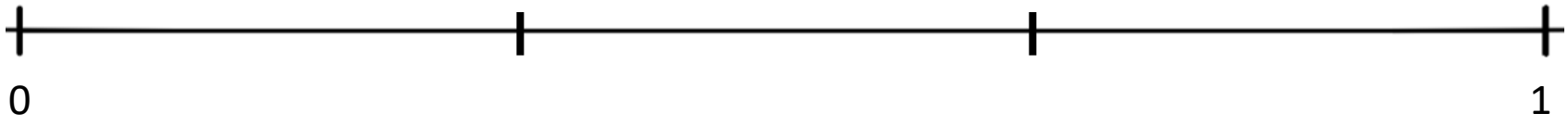

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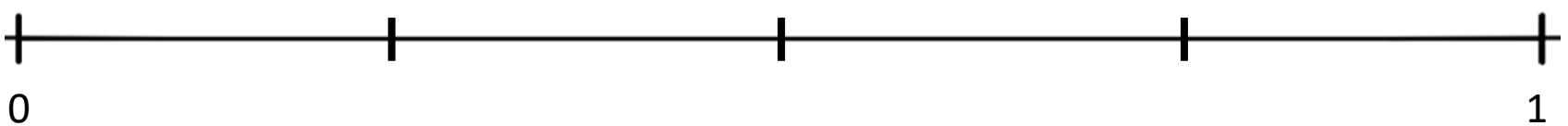

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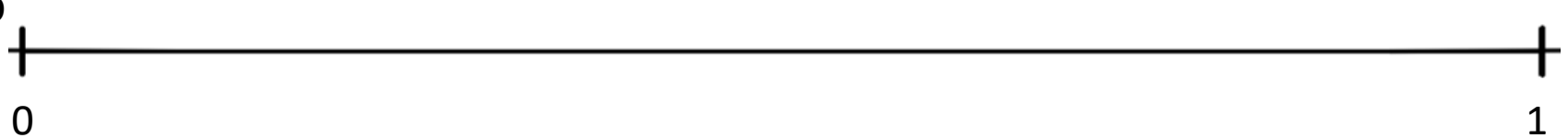

Skill 1.1: Activity 2

Objective:

- To expand a student's knowledge of fractions from part of a whole and part of a set to a number line.
- To identify a fraction on a partitioned number line.
- To place a fraction on a number line that is not partitioned.

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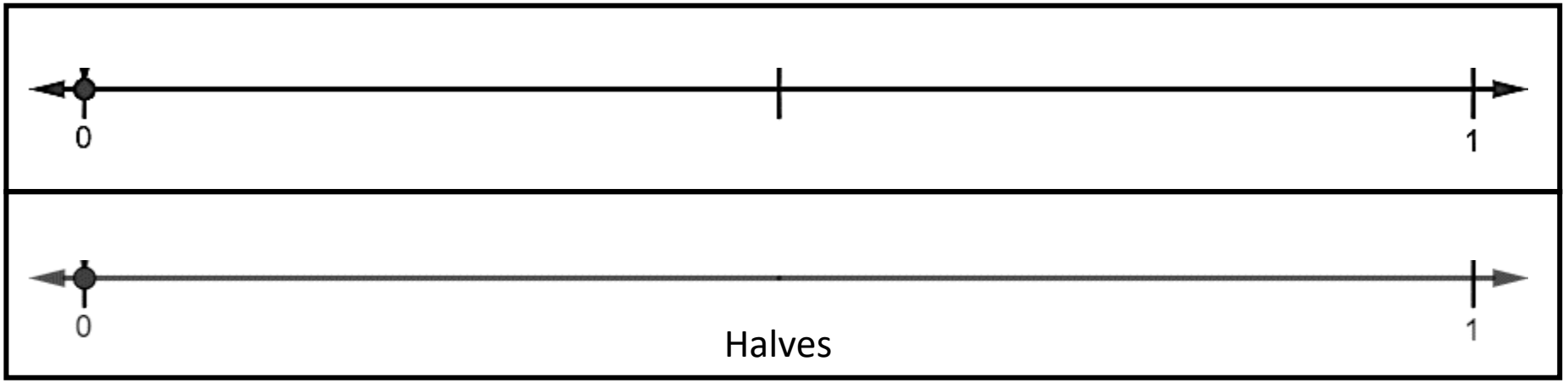
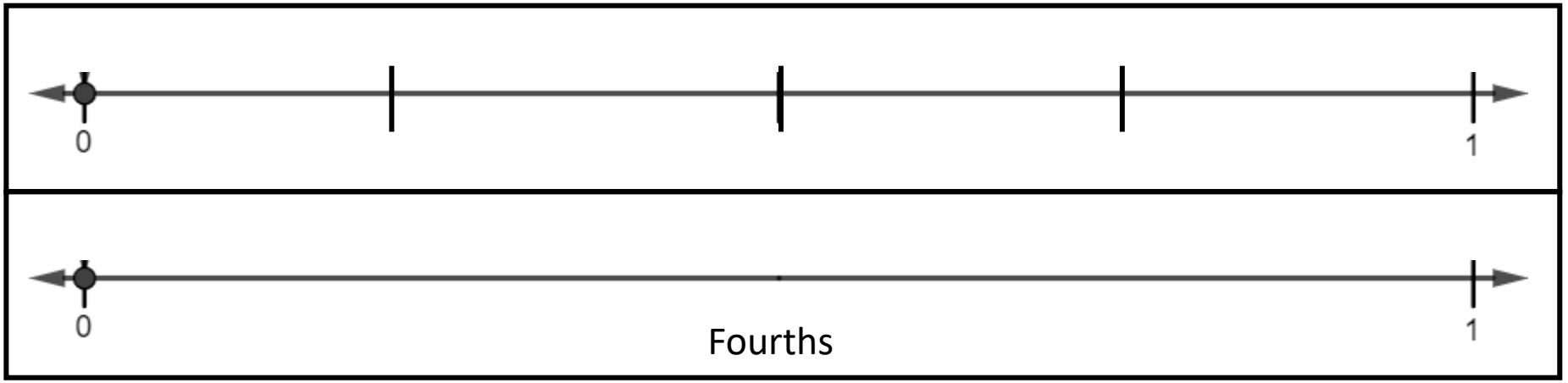
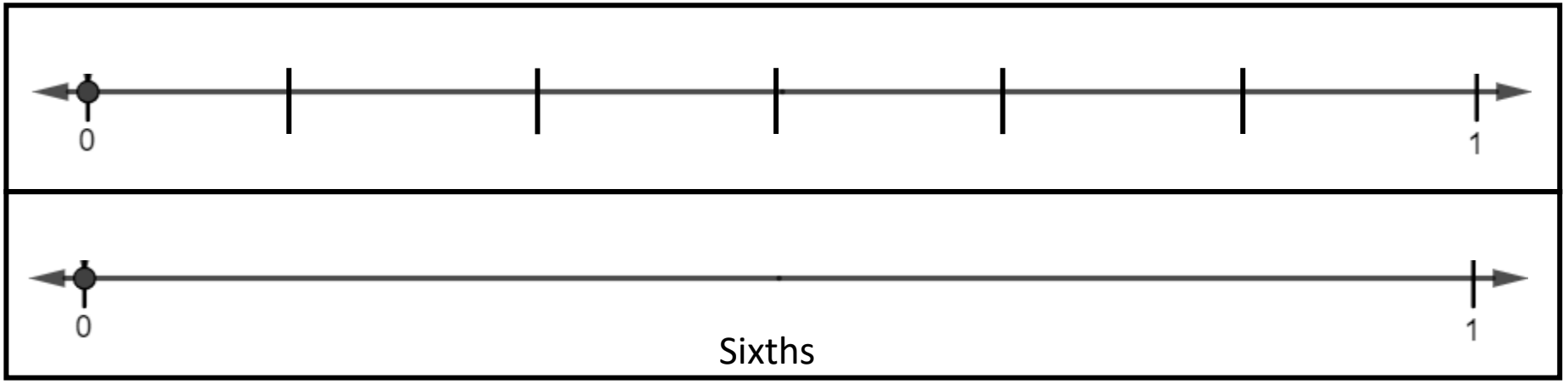
Skill 1.1: Activity 2

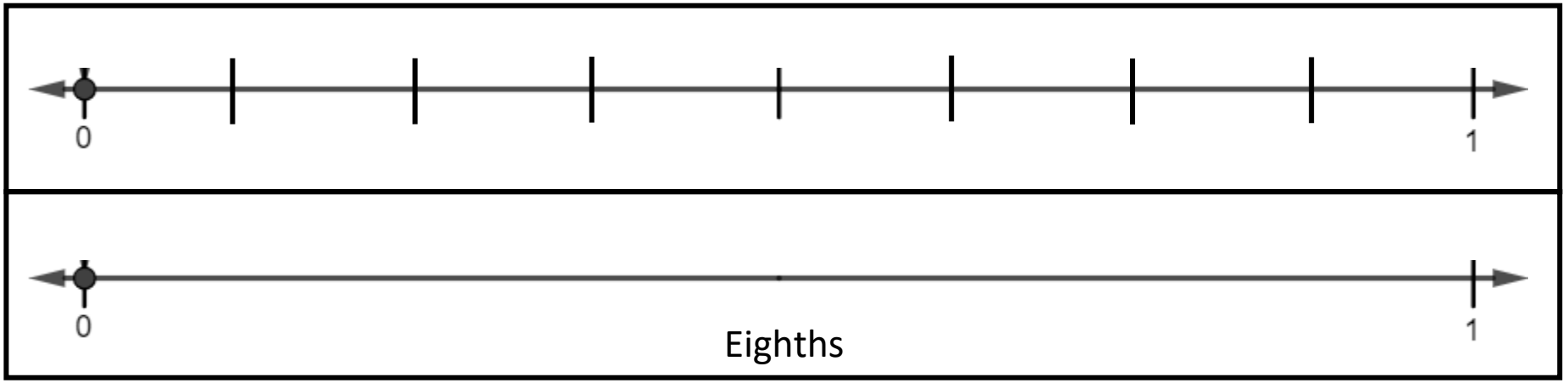


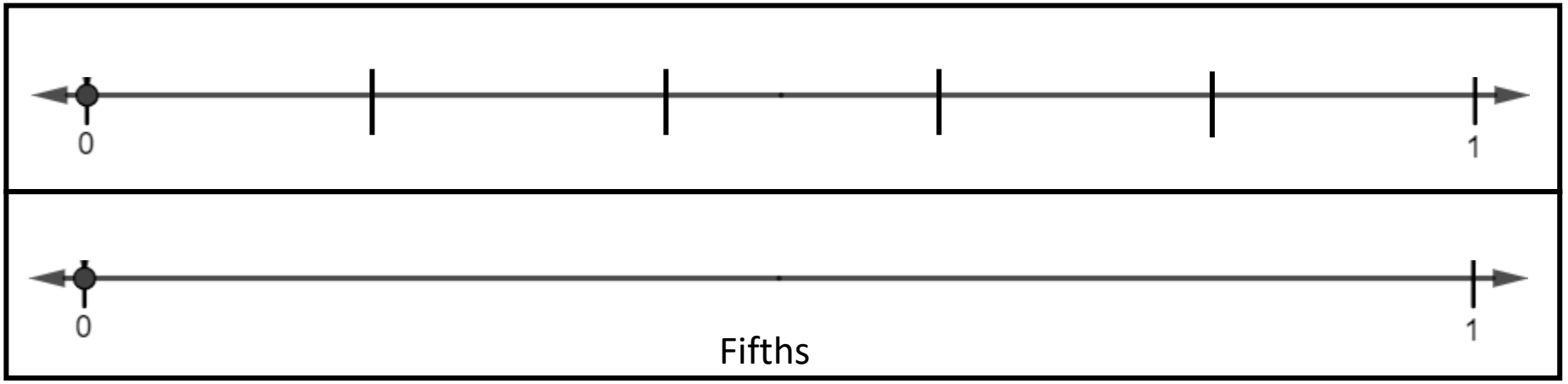
Skill 1.1: Activity 2





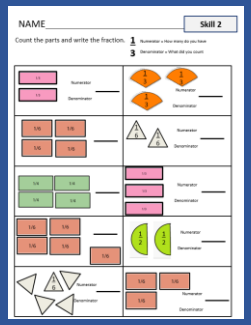
Skill 1.1: Activity 2

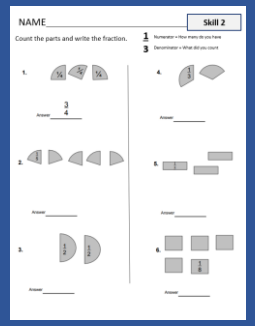


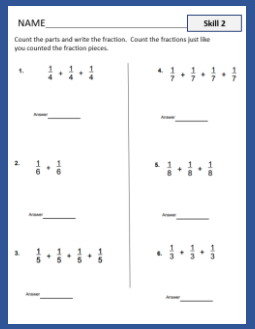


Skill 2

Formative Assessments







Counting By Fractional Parts Up To One

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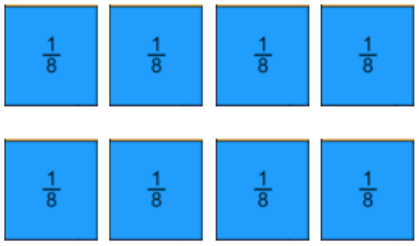
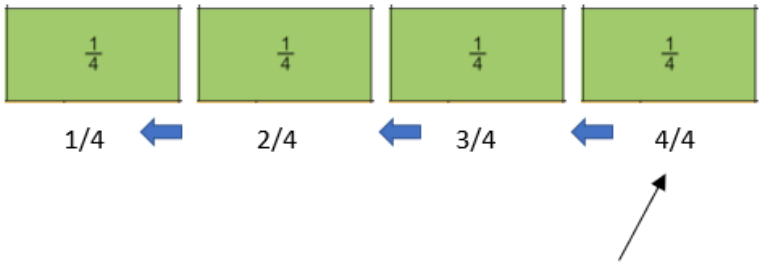
Domain 1

Connecting fractions to the life long skill of counting is essential in making students comfortable with fractions and lays the foundation for a strategy to use with more difficult concepts.



Count up to one by fractional parts. Understanding 8/8 is the same as 1 whole



Count Backwards from 1 to zero.

Numerators and Denominators: "Top and Bottom Numbers"

Numerator "Top Number": the counting number. It tells how many you have.

Denominator "Bottom Number": tells you what fractional part is being counted.

Common Misconceptions:

Student does not understand how to count up to 1 by fractional parts.

Student will start at zero and stop at the first count. 0, 1/8 and then stop.

Student does not understand when the numerator and denominator match, they are at the equivalent of 1.

Student will count past one without realizing they passed one.

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Skill 2: Activity 1

Objective:

- To learn how to count by fractional parts from zero, up to and past one whole.
- To build one whole with language starting at zero.
- Immediately recognize when the numerator and denominator are the same non zero number, you have one whole. 4/4, 6/6
- To learn how to write multiple wholes in the form of a fraction.
  6/1 4/1 5/1

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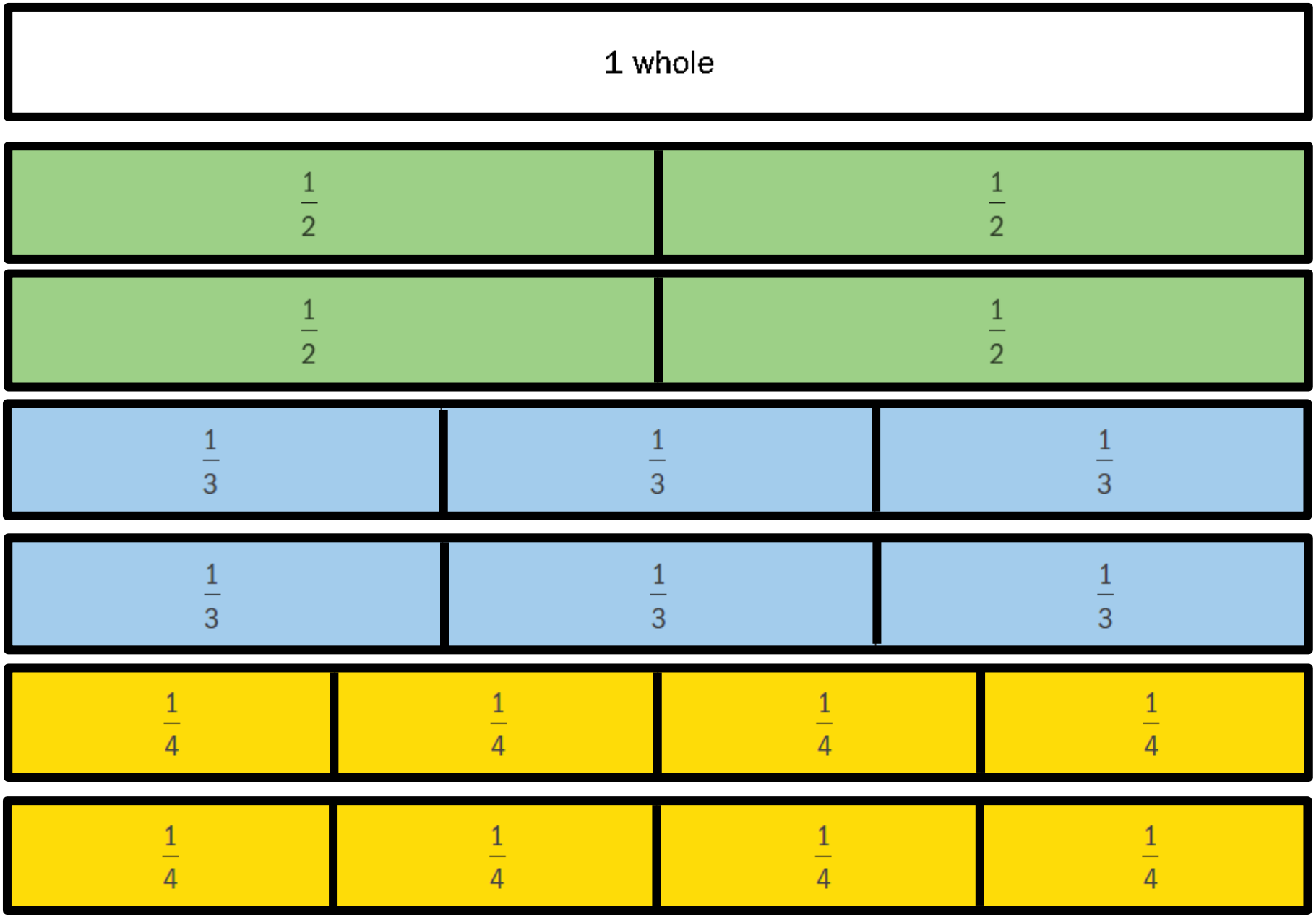
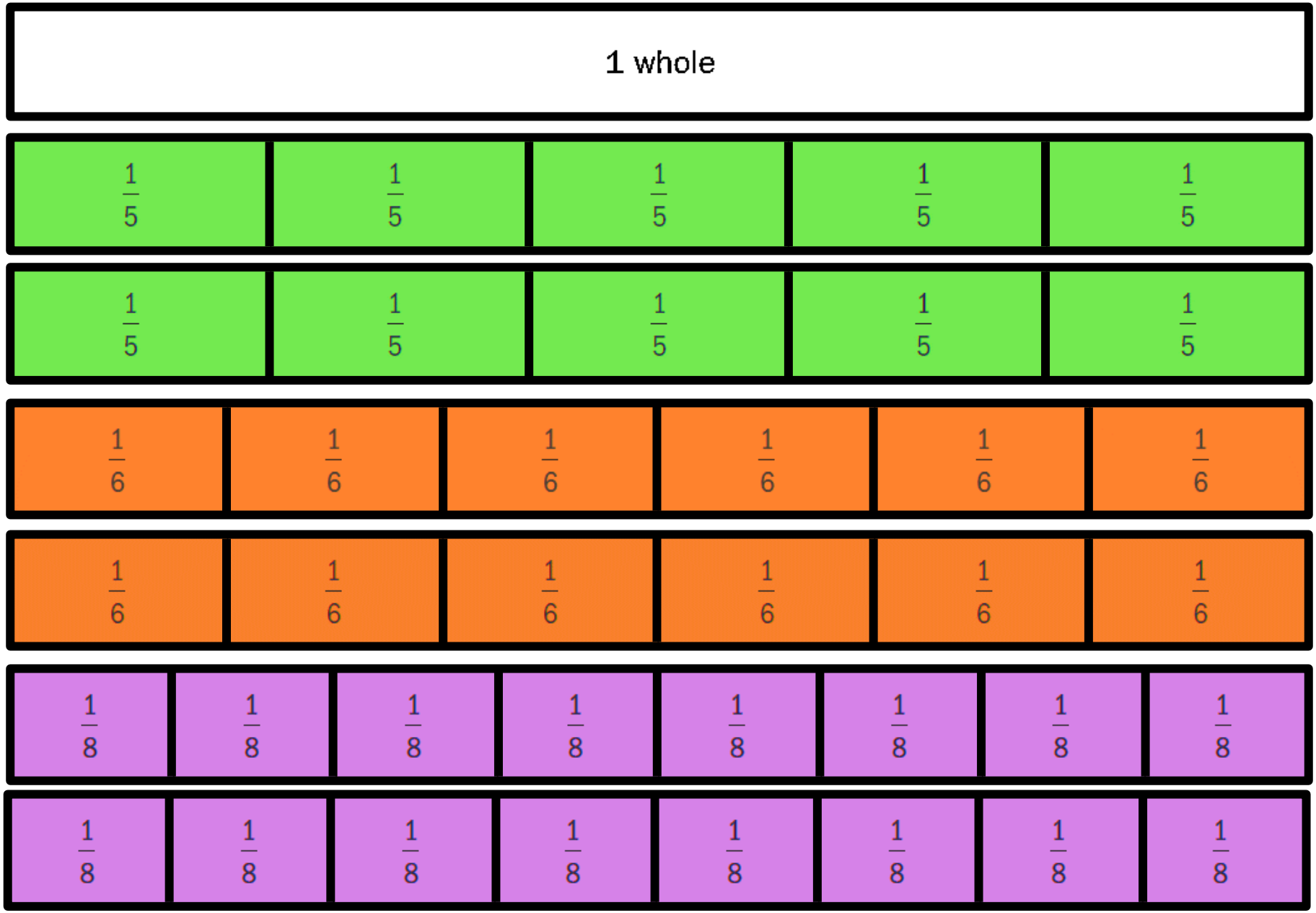
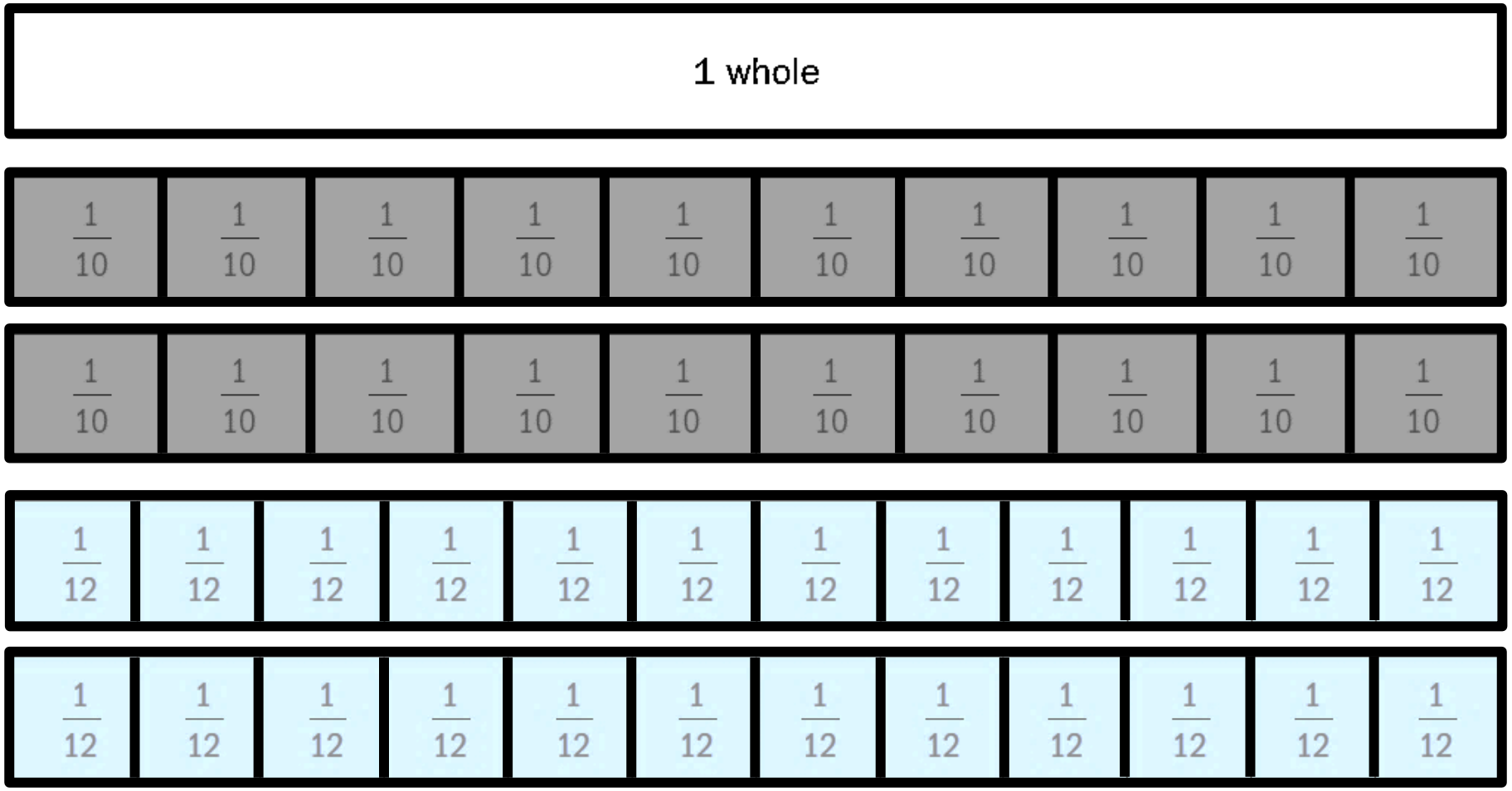
Skill 2: Activity 1



Skill 2: Activity 1

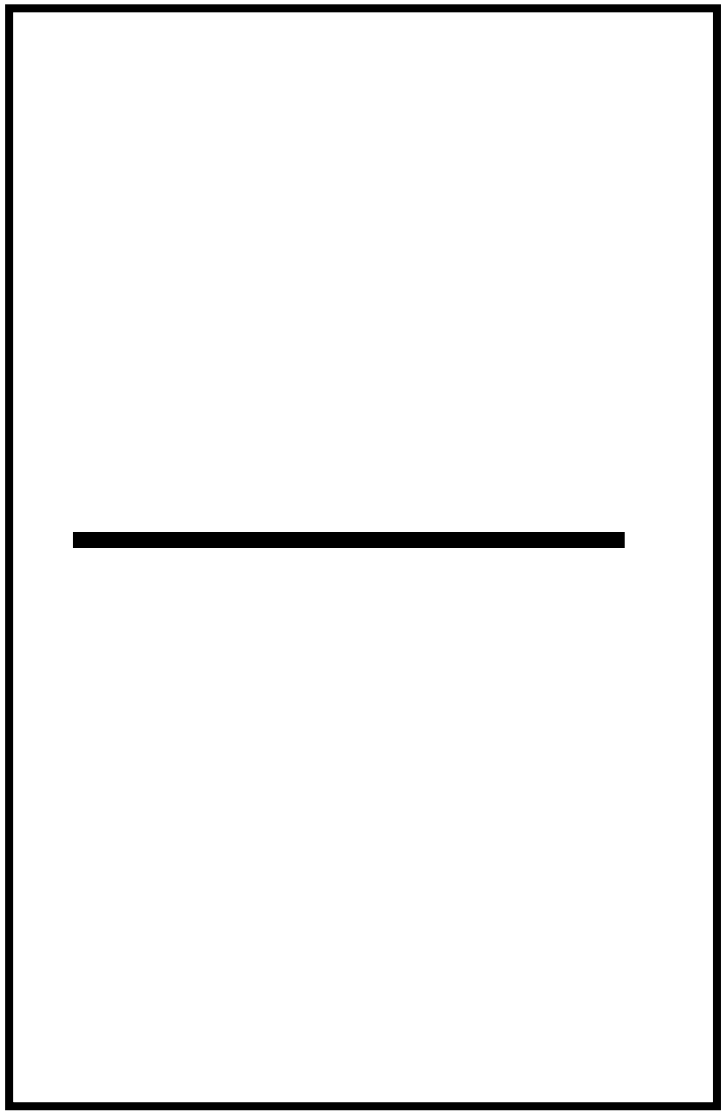


Skill 2: Activity 1



Skill 2: Activity 1

Numerator: → How Many Did You Count



Denominator: → What Did You Count

Skill 2: Activity 2

Objective:

- To learn how to count by fractional parts from zero, up to and past one whole.
- To build one whole with language.
- Immediately recognize when the numerator and denominator are the same non zero number, you have one whole.

Skill 2: Activity 2

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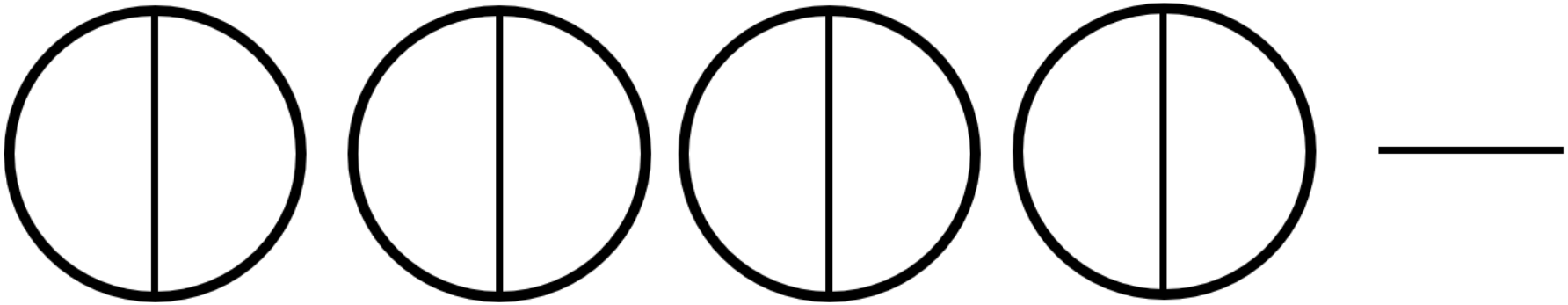
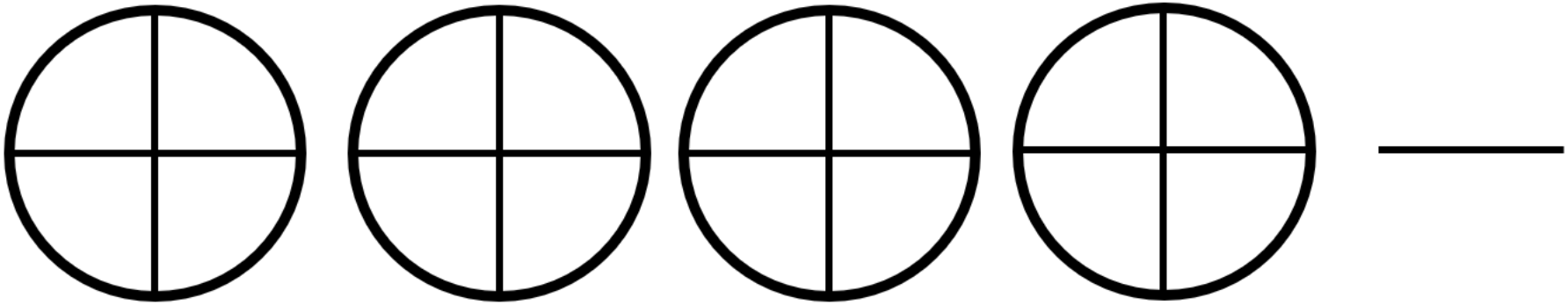
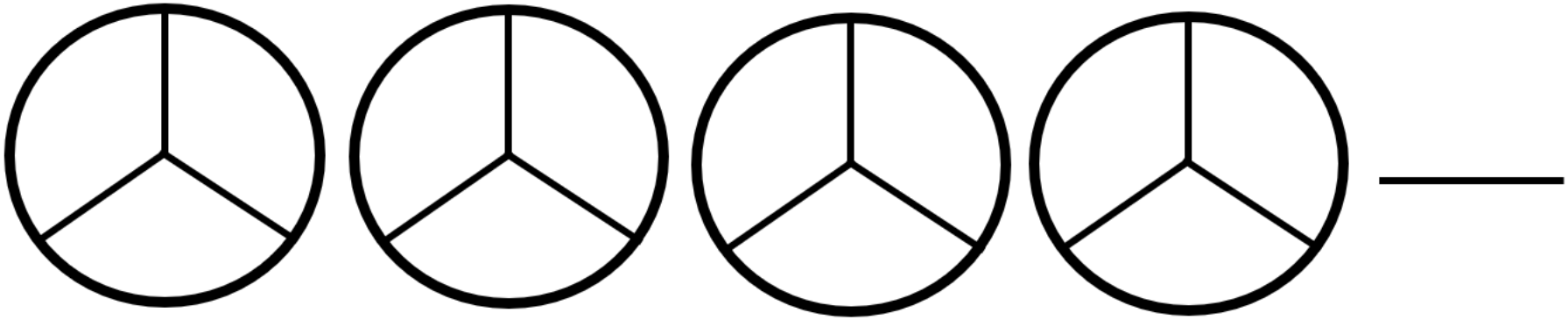
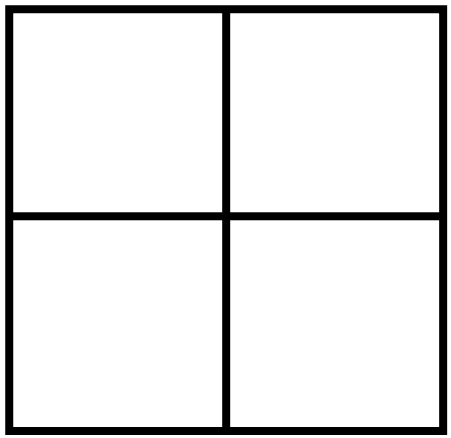
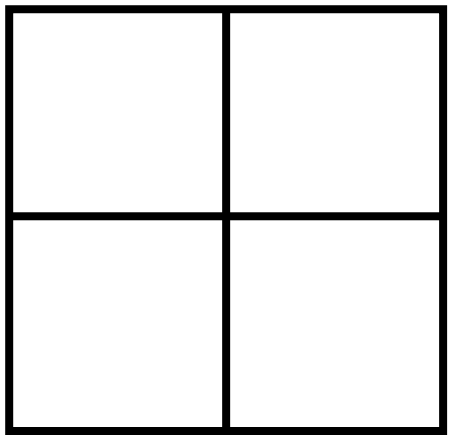


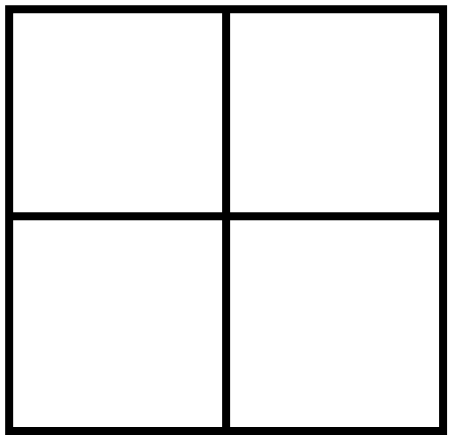


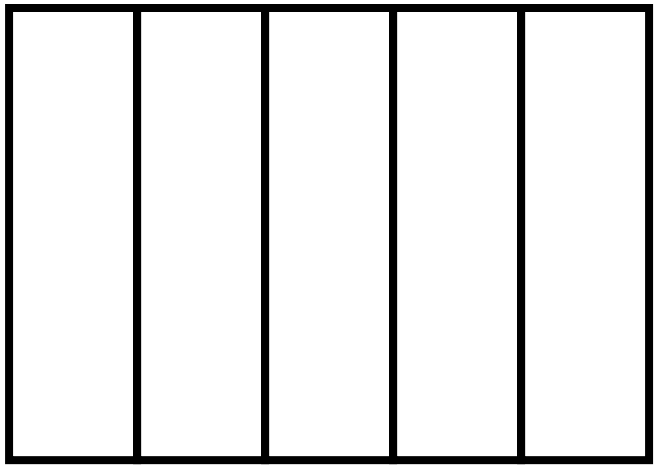


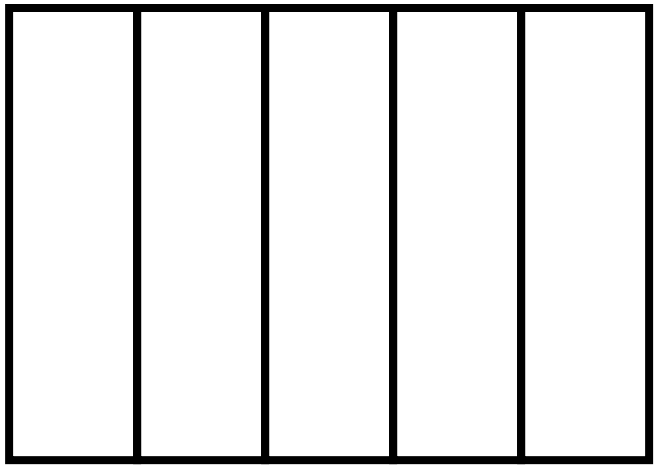
Skill 2: Activity 2









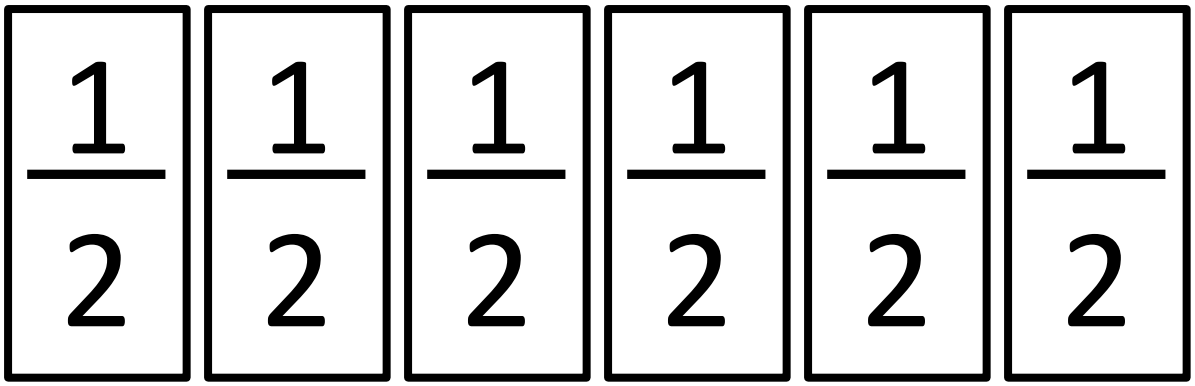


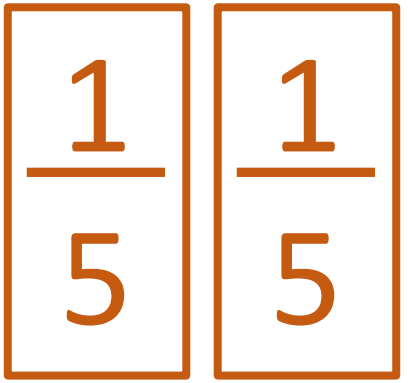
Skill 2: Activity 3

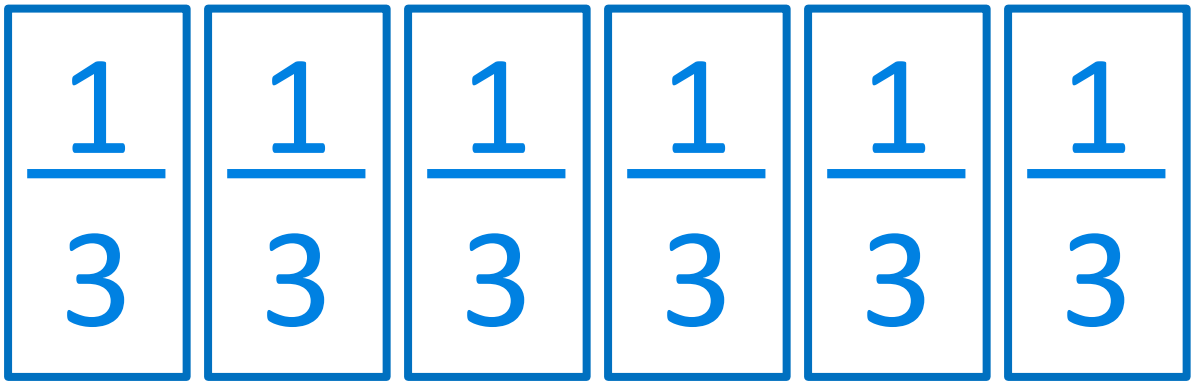
Objective:

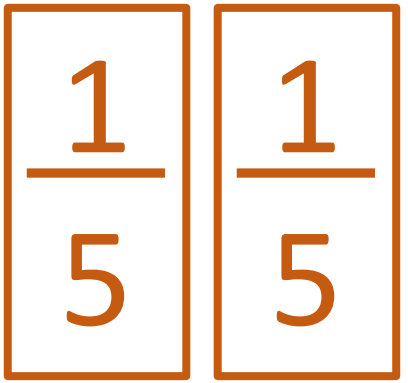
- To learn how to count by fractional parts from zero up to and past one whole.
- To build one whole with language.
- Immediately recognize when the numerator and denominator are the same non zero number, you have one whole.

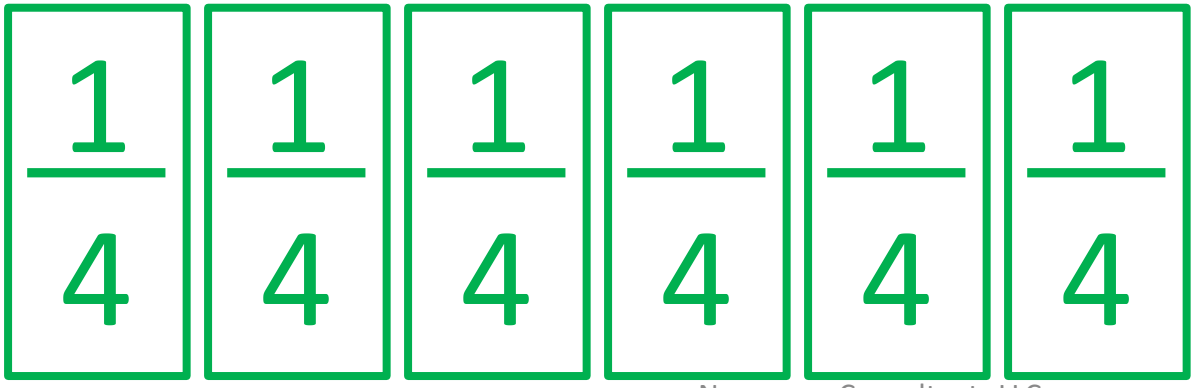
Skill 2: Activity 3

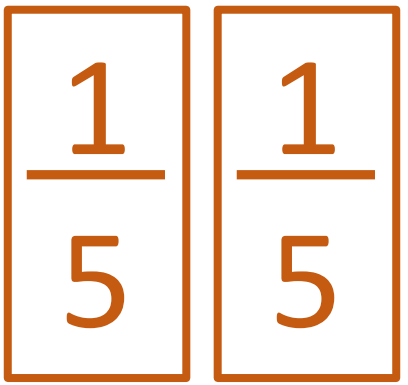






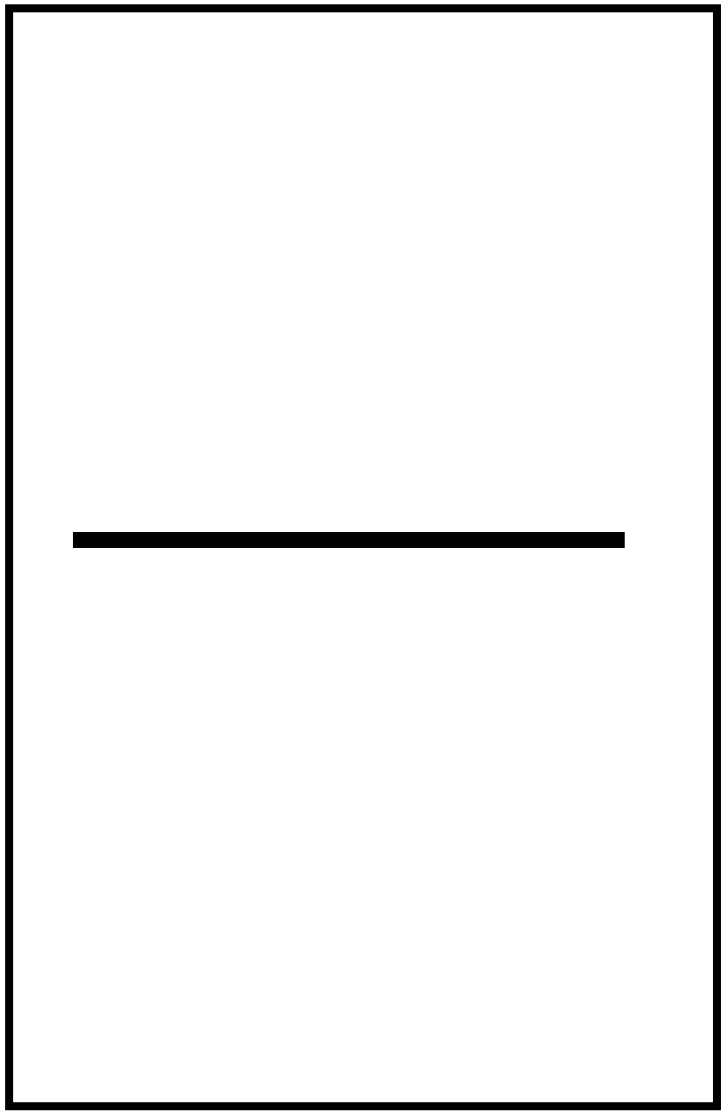






Skill 2: Activity 3

Numerator: How Many Did You Count



Denominator: What Did You Count

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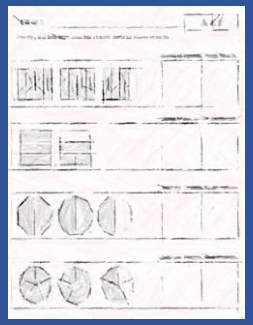
Skill 3

Formative Assessments



Name Improper Fractions or Mixed Numbers

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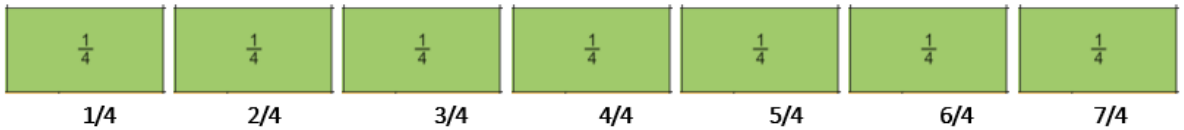
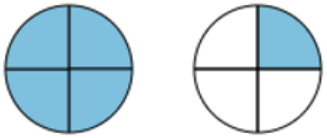
Domain 1

Student needs to identify mixed numbers and improper fractions using the correct language and understand that both are more than one and convert without process.



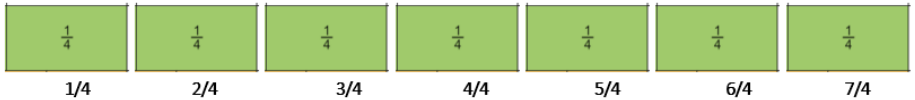
or 1 and ¾



Understand how to identify and name an improper fraction or a mixed number.

5/4 or 1 and ¼

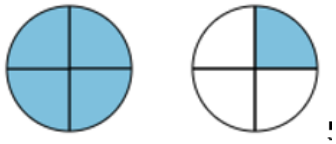
Common Misconceptions:



How many fourths are there? Is it more or less than 1 whole?

$\frac{6}{4}$ → The number or parts counted is 6.
Fourths is what is being counted.

Student does not understand that 7/4 is greater than one. Since it is in fraction form, it must be less than one.



Student will claim that 5/8 is shaded in because they see 5 piece out of 8. They do not account for multiple wholes, just the pieces that they see.

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Skill 3: Activity 1

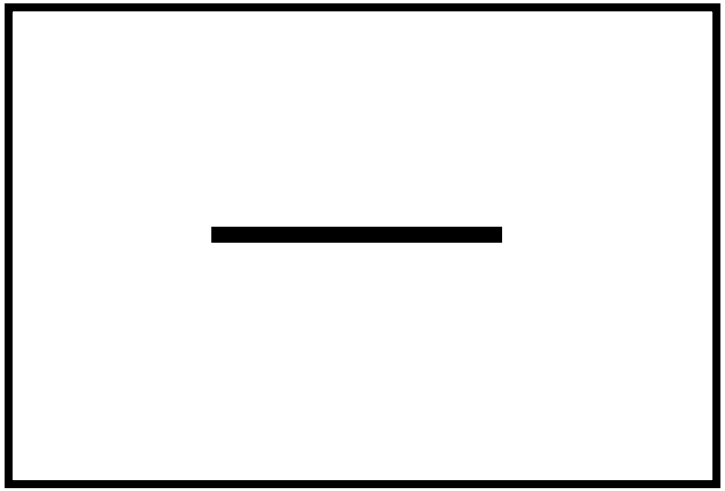
Objective:

- To understand mixed numbers and improper fractions both exist at the same time. The quantity is the same but the structure is different.

- Use knowledge of one whole and counting by fractional parts to understand how to do non process / procedure conversions.

Skill 3: Activity 1

Improper Fraction (Pieces Separated)



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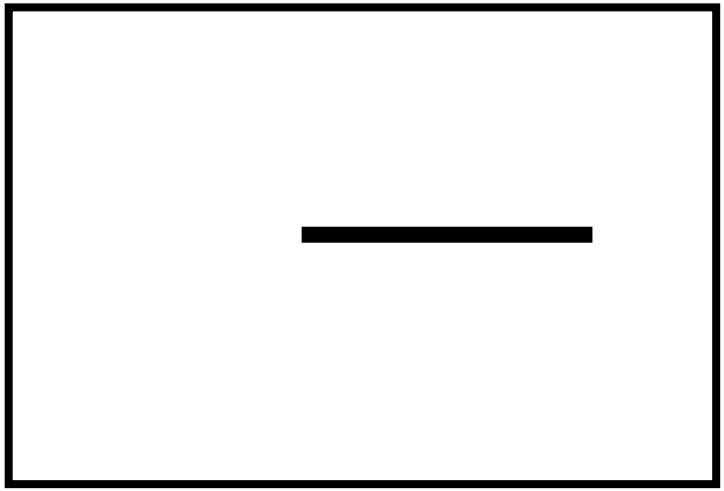
Mixed Number(Pieces Put Together)



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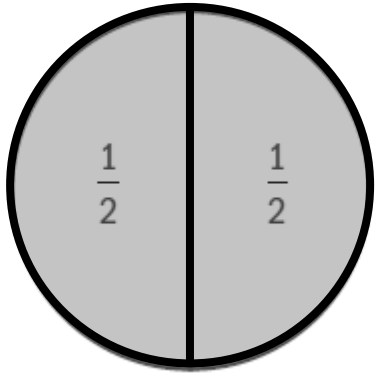
1 whole


1 whole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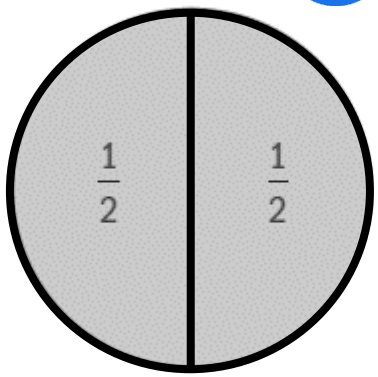
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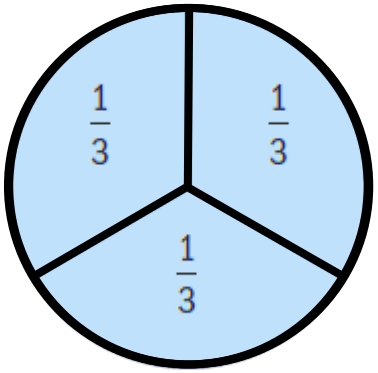
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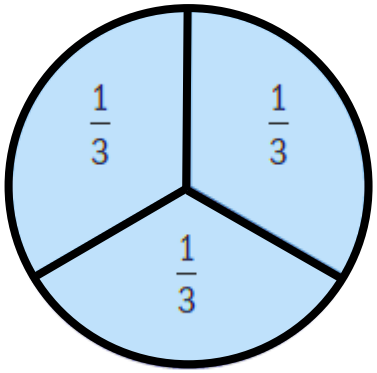
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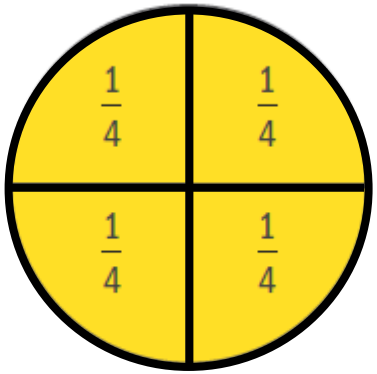
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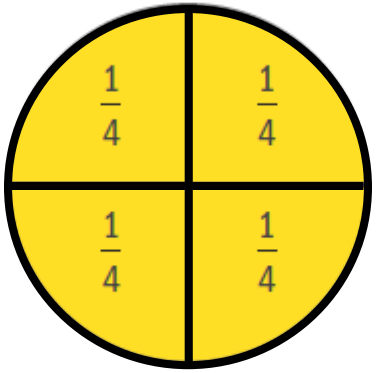
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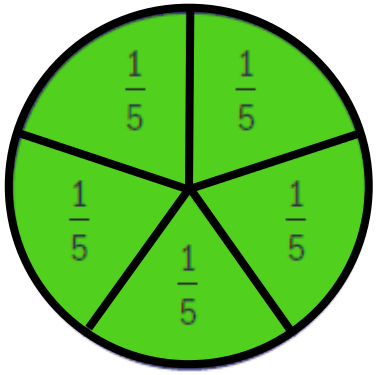
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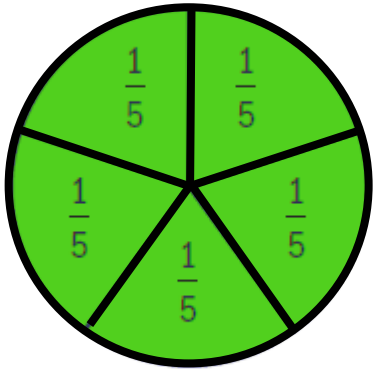
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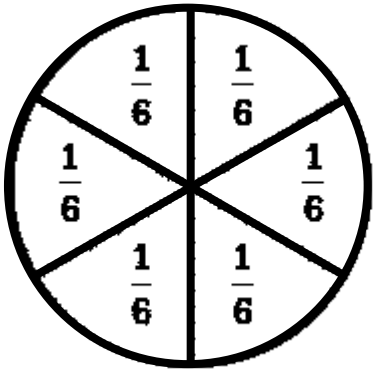
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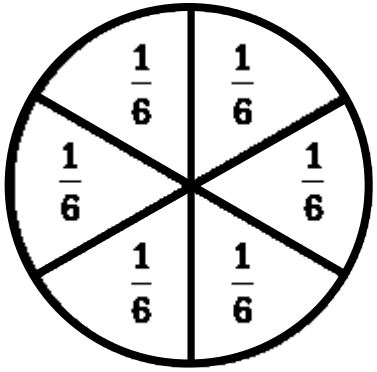
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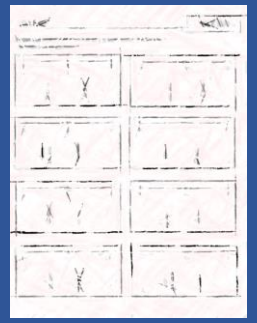
Skill 3.1

Formative Assessments

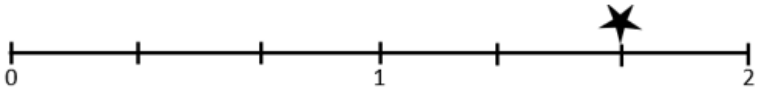


Name Improper Fractions / Mixed Numbers on a Number Line

Numeracy Consultants LLC

Domain 1

Student needs to transfer their knowledge of area and set models with improper fractions and mixed number, and apply it to a number line or length model.

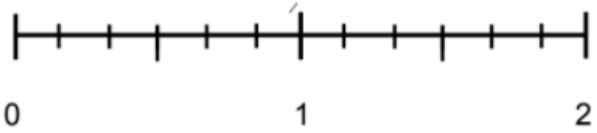


Place mixed numbers or improper fractions on a number line.

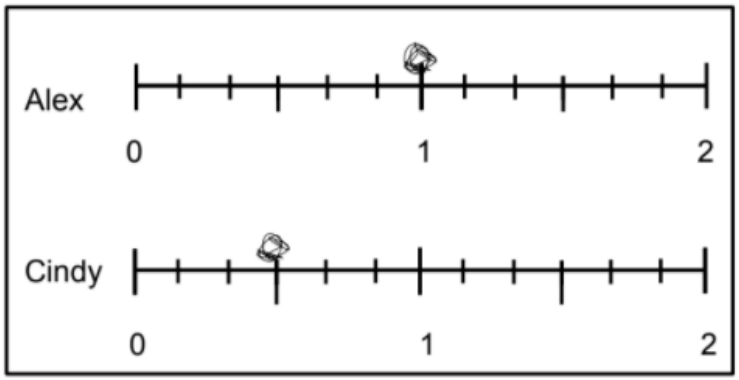
"Where would 1 and 2/3 go on the number line"

Common Misconceptions:

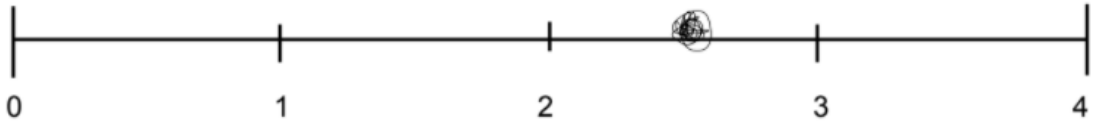
Draw a dot where ½ would go.



Student does not acknowledge that multiple whole numbers can be on a number line. They treat the number line as only one whole.



Draw a dot where 2/3 would go.



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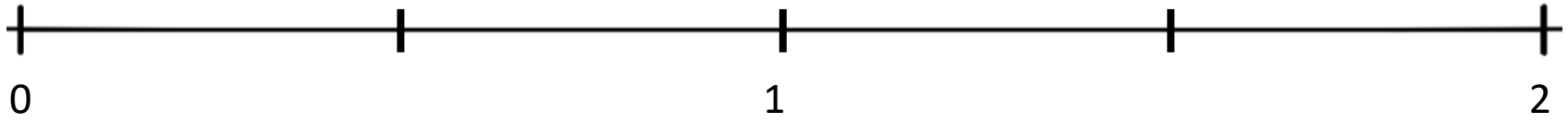
Skill 3.1: Activity 1

Objective:

- To identify and place mixed numbers / improper fractions on a number line.

- To extend their current knowledge of fractions less than 1 on a number line to fractions greater than 1.

A



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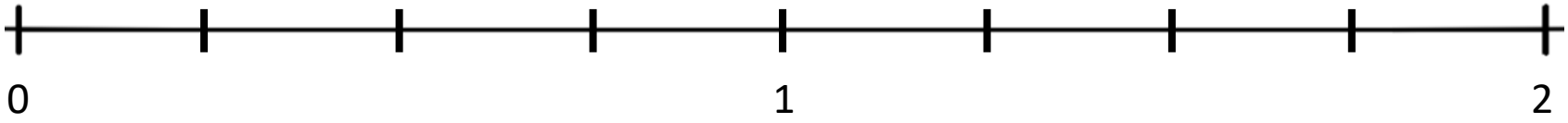

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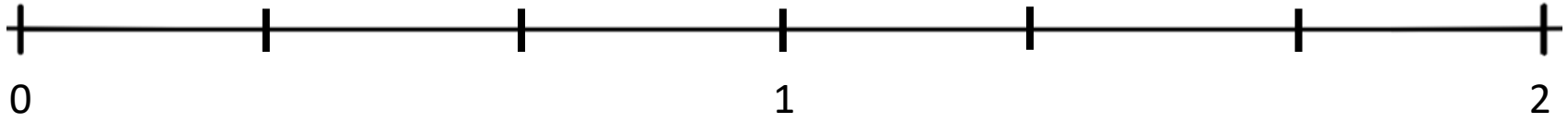

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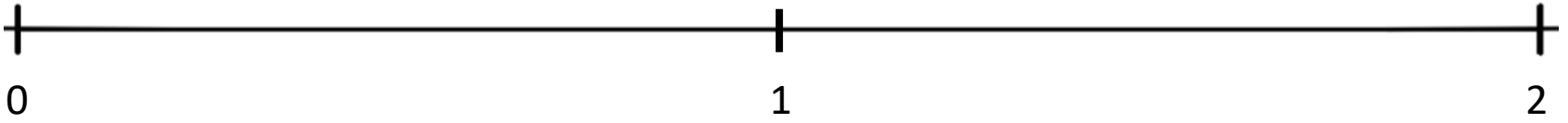
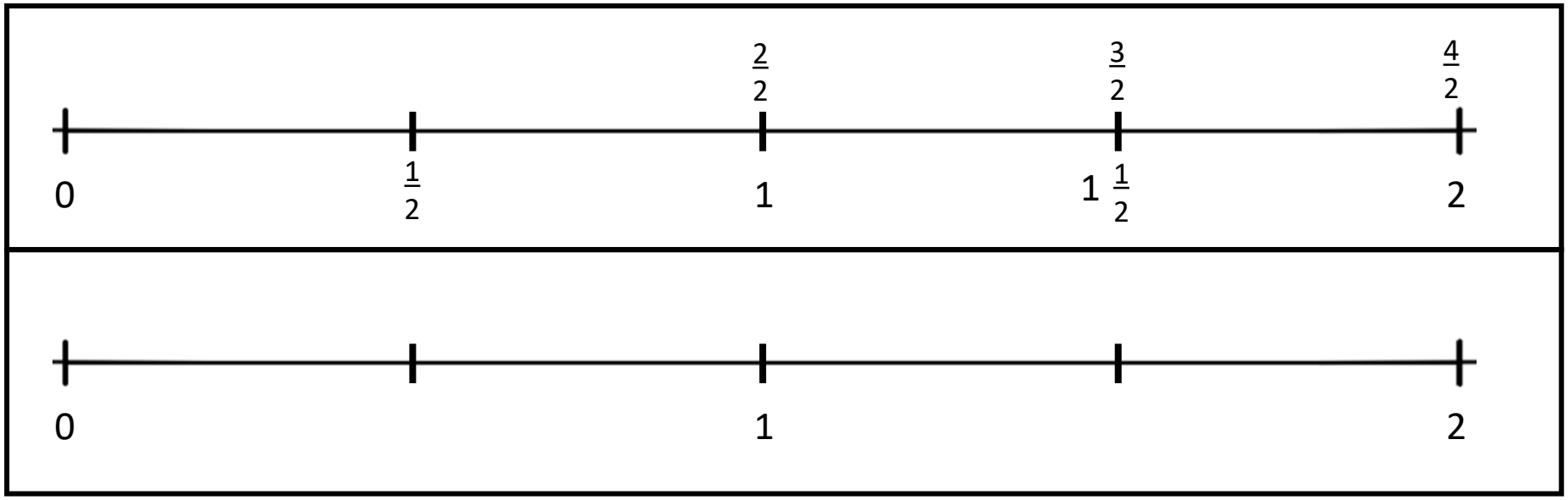


Skill 3.1: Activity 2

Objective:

- To identify and place mixed numbers / improper fractions on a number line.

- To extend their current knowledge of fractions less than 1 on a number line to fractions greater than 1.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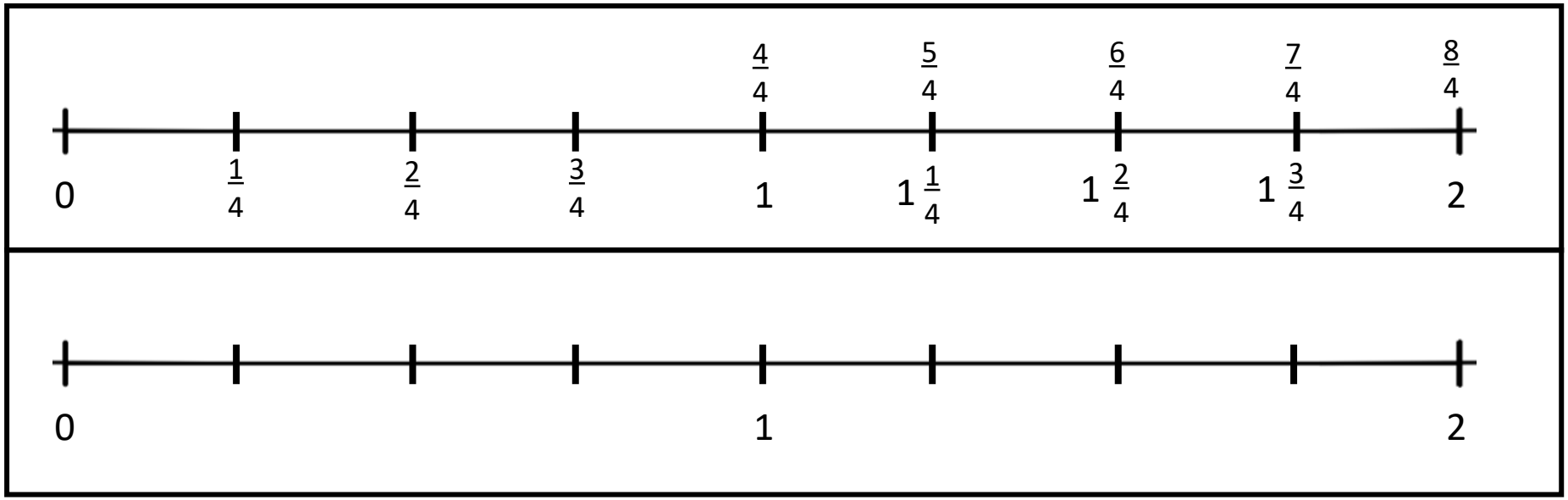
3/2
4/2


0
1/4
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1
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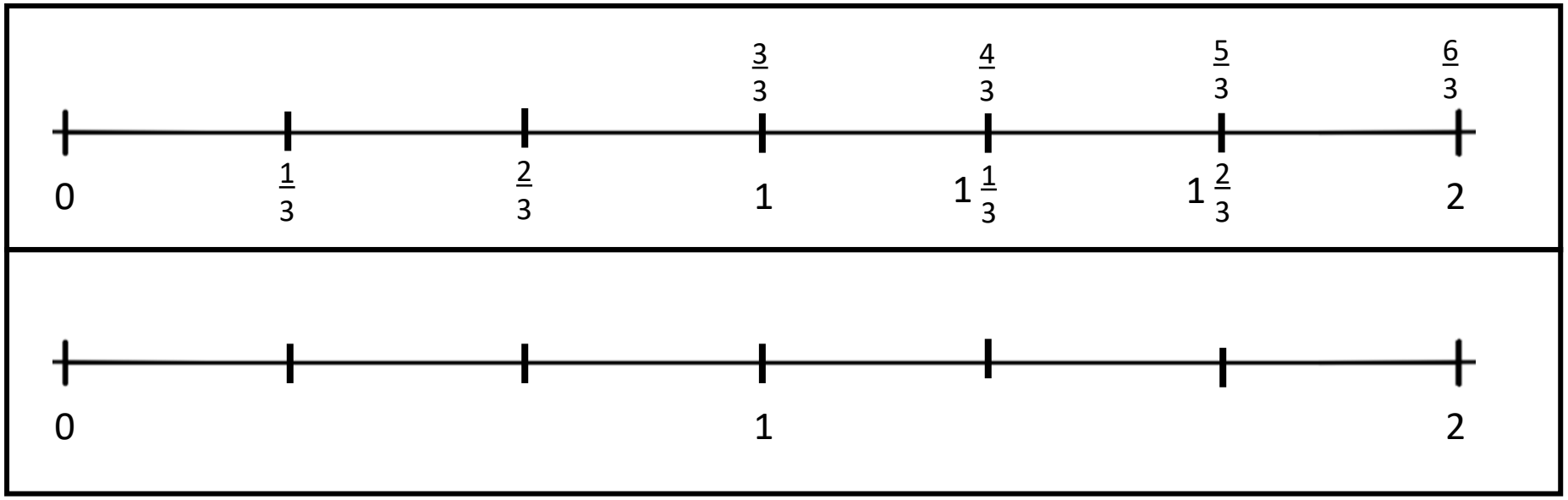
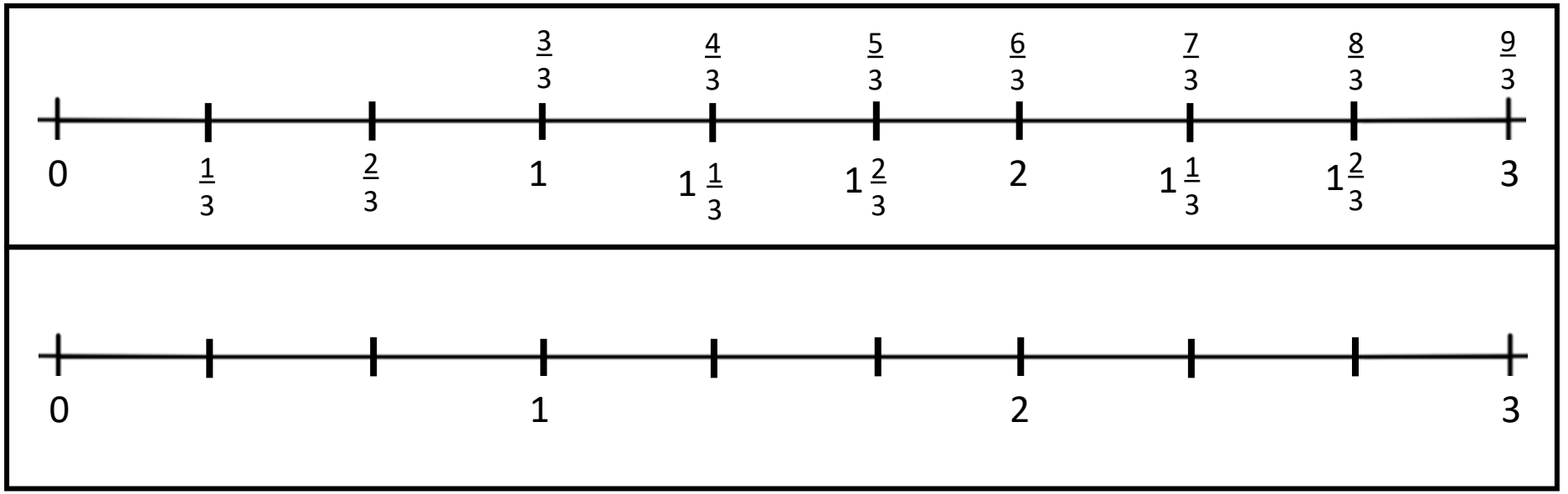
8/4

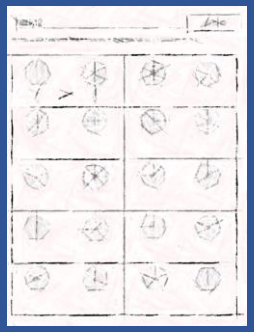


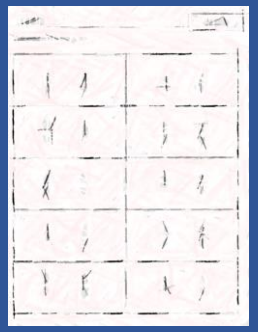


Skill 3.1 : Activity 2

Skill 4

Formative Assessments



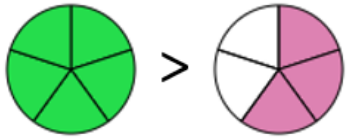


A Fraction Less than One / One Whole Structure

Numeracy Consultants LLC

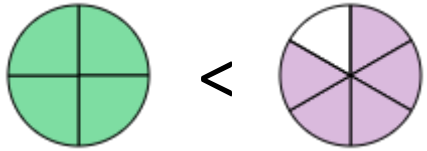
Domain 1

Understand a fraction with a numerator that is 1 less than its denominator is less than one whole. One whole can exist in several different ways.



A fraction is less than one whole. Understand this with both visual models and numerical representations. One whole can be represented in different ways. 1 or 3/3 are the same. Compare and be able to explain why one whole is greater than a fraction with multiple representations of one whole including number lines.

Common Misconceptions:



Student will focus on the number of pieces instead of the amount of area each piece covers. " 5/6 is greater than 4/4 because 5 pieces is more than 4"

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

Student will inappropriately apply whole number reasoning with fraction comparisons.

Student does not understand that one whole can exist in more than one way.

"1 is greater than 4/4 because One is a whole and 4/4 is a fraction"

$\frac{8}{8} > \frac{3}{3}$

8/8 is greater then 3/3 because 8 is greater than 3.

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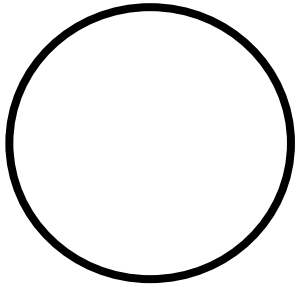
Skill 4: Activity 1

Objective:

- To understand a proper faction is less than one whole.
- One whole can exist in many different structures.



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

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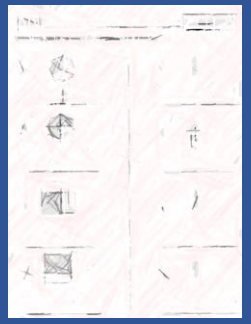
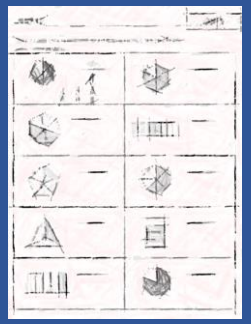
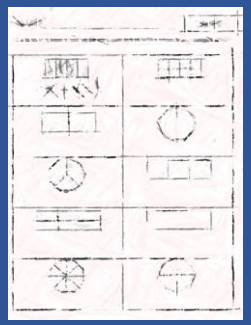
Skill 4 : Activity 1

Skill 5

Formative Assessments







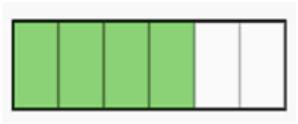
Completes a Whole When Given the Part

Numeracy Consultants LLC

Domain 1

Understanding how to complete one whole within context helps solidify the concept of one whole and helps with future skills like comparing and estimating for reasonableness.

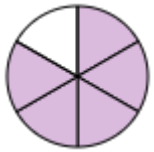
"How much is needed to make one whole"



$\frac{3}{5}$

Complete a whole when given the part. This reinforces the concept that a fraction is just a part of a larger whole. Use both visual and numerical representations. "How much is needed to make one whole"

Common Misconceptions:



Student does not understand a fraction exists within the context of one whole.

$\frac{4}{6}$

When asked how much more is needed to make one whole, they will respond in whole numbers instead of with fractional parts. "With 5/6, how much more do we need to have a whole?" Student will respond "1" instead of 1/6.

$\frac{2}{8}$

When asked how much more would you need to have one whole, they are unable to respond.

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Skill 5: Activity 1

Objective:

- To understand how to complete or make one whole when given the fractional part.

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

How much is needed to make 1 whole?

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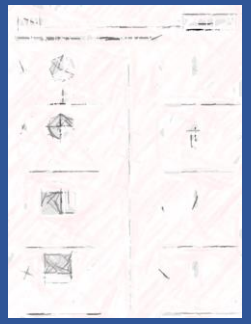
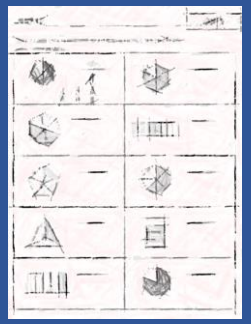
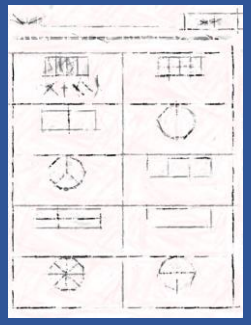
Skill 6

Formative Assessments





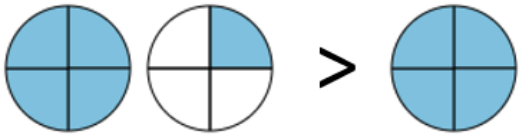


Improper Fractions / Mixed Numbers Are Greater Than One

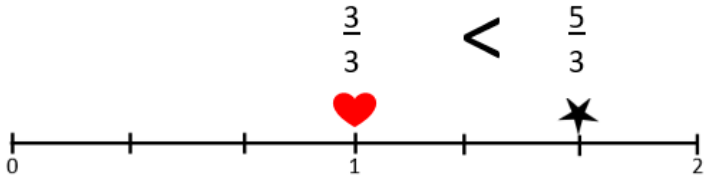
Numeracy Consultants LLC

Domain 1

Understand improper fractions and mixed numbers are greater than one.



$\frac{7}{5} > \frac{12}{12}$

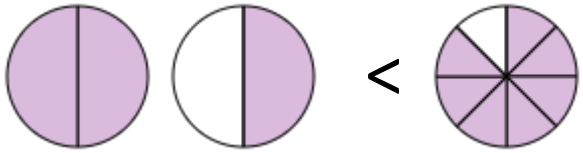


Understand an improper fraction or mixed number is more than one whole by using both visual models, number lines, and numerical representations.

Be able to immediately identity **all forms** of fractions that are greater than one instantly without effort. No process or procedure should be involved.

$\frac{10}{12} < 1\frac{1}{4}$

Common Misconceptions:



Student will focus on the number of the parts, not the total area of the parts. " 7/8 has 7 pieces and the other fraction only has 3 pieces"

$\frac{7}{6} < \frac{8}{8}$

8/8 is more than 7/6 because 8 is more than 7.

$1\frac{1}{4} < \frac{7}{9}$

Student does not recognize the different structures that one whole can exist. 7 and 9 are both larger than 1, 1, and 4. Student uses whole number reasoning.

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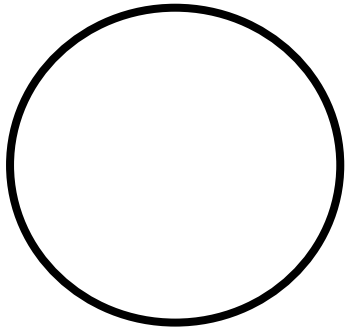
Skill 6: Activity 1

Objective:

- To understand both mixed numbers and improper fractions are greater than 1.

- Fractions greater than one can exist in many different structures.



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

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