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## Module 3 - Lesson 2:

Interpret fractions as division to find fractions of a set with tape diagrams and number lines.

CCSS Standard – 5.NF.B.4.a / 5.NF.B.5.b

**FLUENCY (10-min)**

**Happy Counting by Halves – Visualizing a Number line**

When I give this signal, count up.



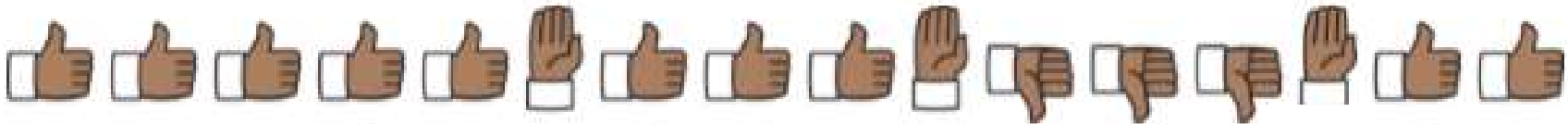
When I give this signal, count down.



When I give this signal, stop.

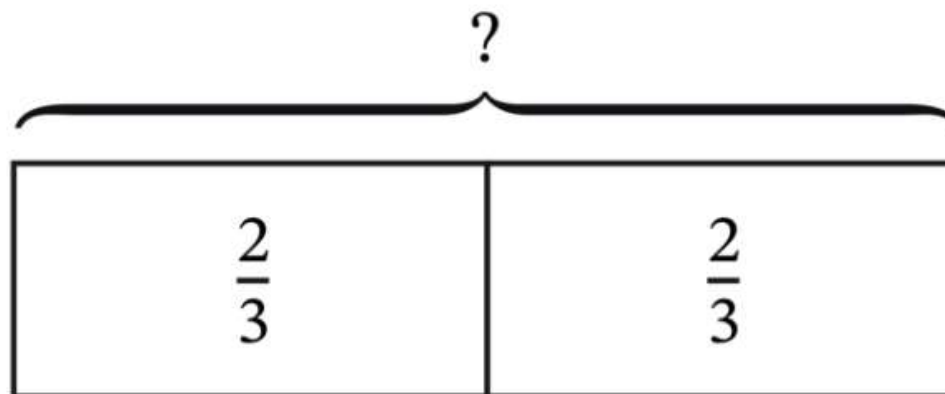


Let's count by halves. Today we will rename fractions as whole or mixed numbers when possible. The first number you say is 0 halves. Ready?



**FLUENCY** (10-min)

## Whiteboard Exchange: Relate Repeated Addition to Multiplication



**Write a repeated addition equation to represent the tape diagram.**

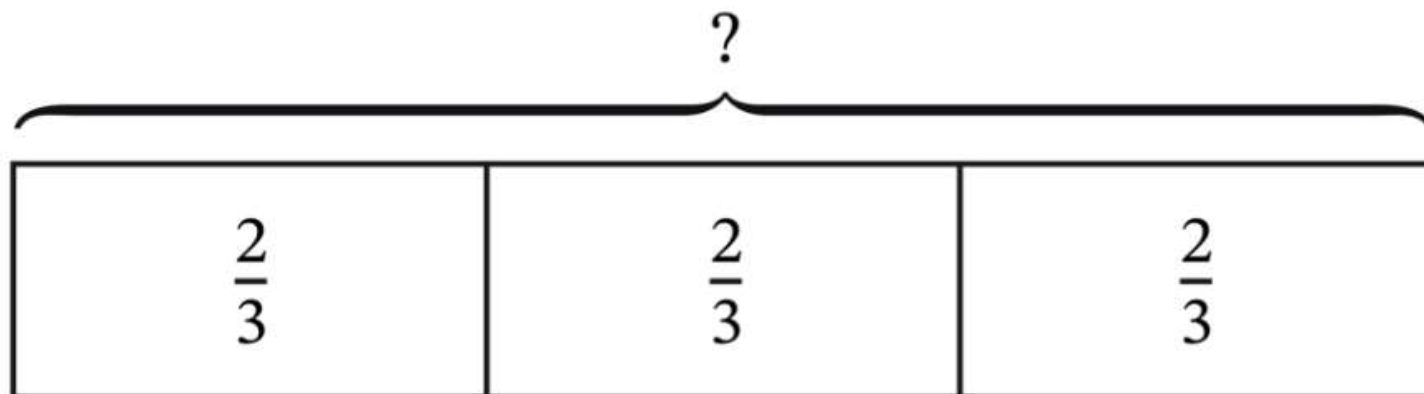
**Write the sum as a fraction.**

**Now, write a multiplication equation to represent the tape diagram.**

**Write the product as a fraction.**

**FLUENCY** (10-min)

## Whiteboard Exchange: Relate Repeated Addition to Multiplication



Write a repeated addition equation to represent the tape diagram.

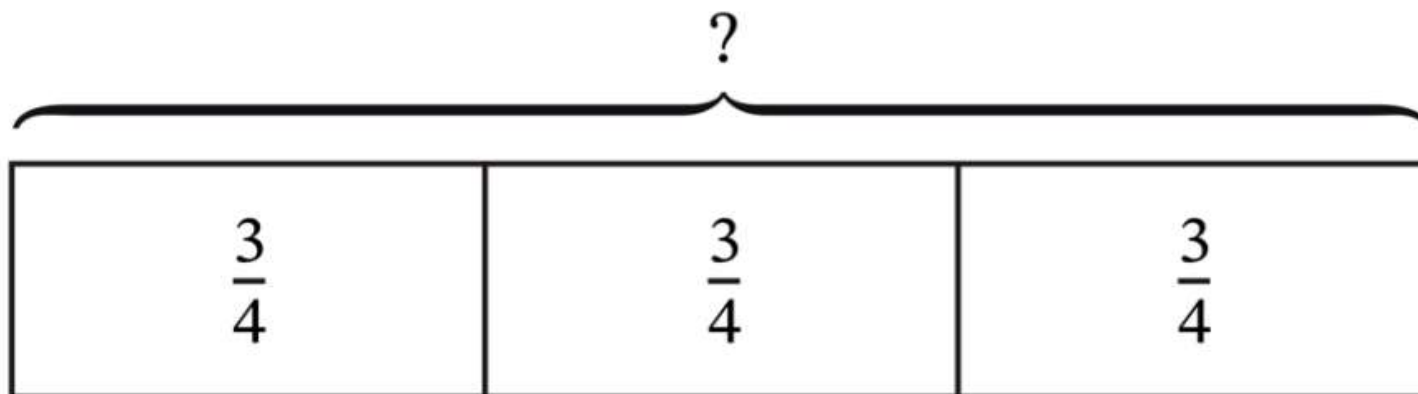
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**FLUENCY** (10-min)

## Whiteboard Exchange: Relate Repeated Addition to Multiplication



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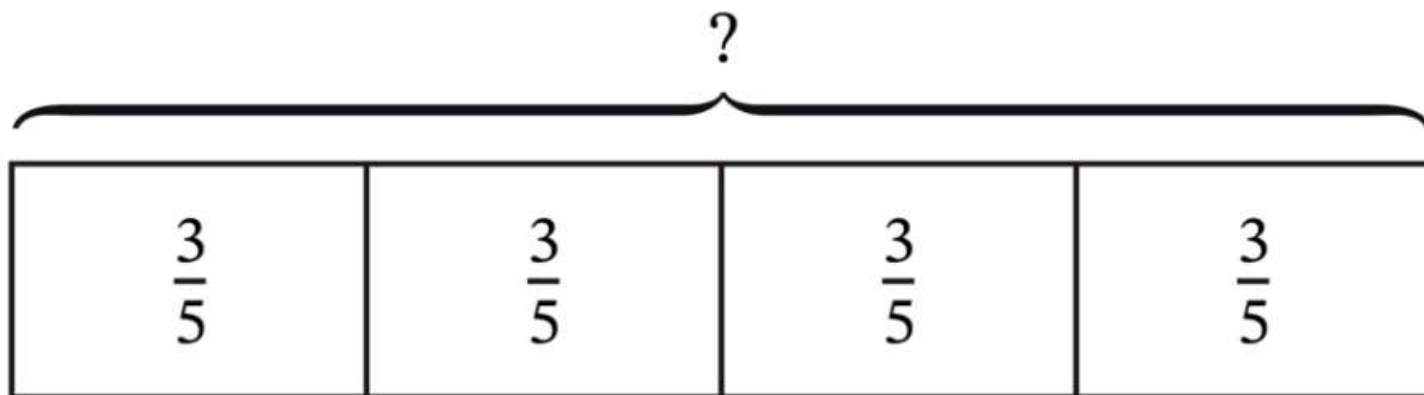
Write the sum as a fraction.

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**FLUENCY** (10-min)

**Whiteboard Exchange: Relate Repeated Addition to Multiplication**



**Write a repeated addition equation to represent the tape diagram.**

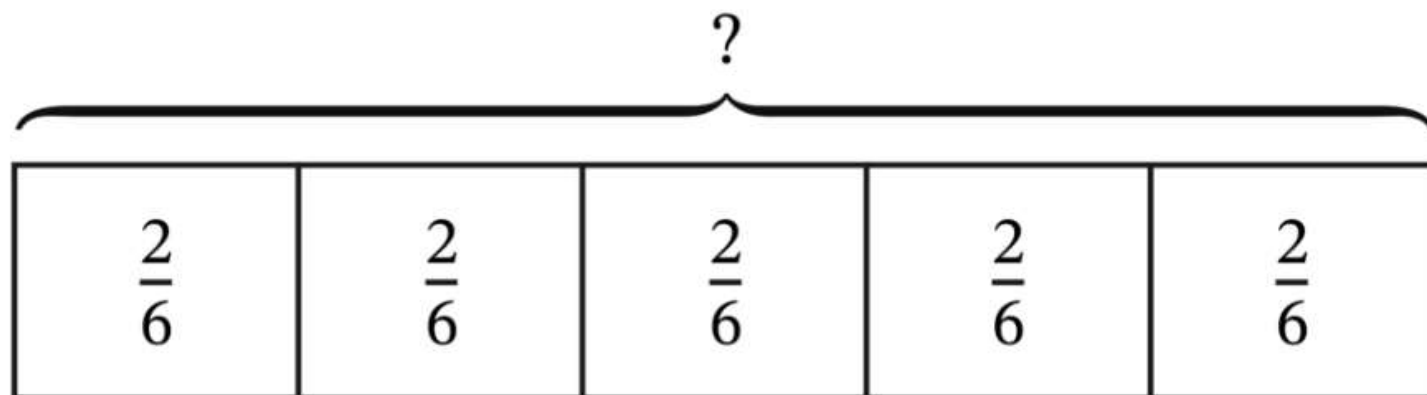
**Write the sum as a fraction.**

**Now, write a multiplication equation to represent the tape diagram.**

**Write the product as a fraction.**

**FLUENCY** (10-min)

## Whiteboard Exchange: Relate Repeated Addition to Multiplication



**Write a repeated addition equation**  
to represent the tape diagram.

**Write the sum as a fraction.**

**Now, write a multiplication equation**  
to represent the tape diagram.

**Write the product as a fraction.**

**FLUENCY** (10-min)

## Whiteboard Exchange: Interpret a Fraction as Division



Write the fraction as a division expression.  
Then express the quotient as a whole number.

$$\frac{2}{2} = \underline{\quad} \div \underline{\quad} =$$

$$\frac{3}{2} = \underline{\quad} \div \underline{\quad}$$

$$\frac{8}{4} = \underline{\quad} \div \underline{\quad} =$$

$$\frac{11}{4} = \underline{\quad} \div \underline{\quad} =$$



**FLUENCY** (10-min)

**Whiteboard Exchange: Interpret a Fraction as Division**



Write the fraction as a division expression.  
Then express the quotient as a whole number.

$$\frac{13}{6} = \underline{\hspace{2cm}} \div \underline{\hspace{2cm}} =$$

$$\frac{18}{6} = \underline{\hspace{2cm}} \div \underline{\hspace{2cm}} =$$

$$\frac{35}{7} = \underline{\hspace{2cm}} \div \underline{\hspace{2cm}} =$$

$$\frac{60}{7} = \underline{\hspace{2cm}} \div \underline{\hspace{2cm}} =$$

**LAUNCH** (5-min)

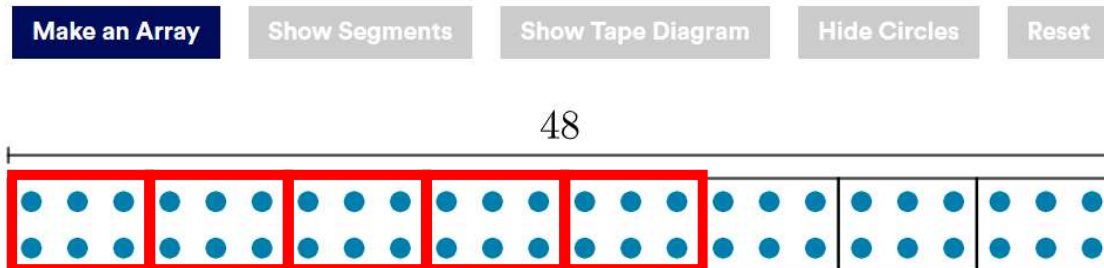
What type of model is most efficient to find a fraction of a set?



Mr. Evans has 48 pencils.

$\frac{5}{8}$  of the pencils are sharpened.

How many pencils are sharpened?



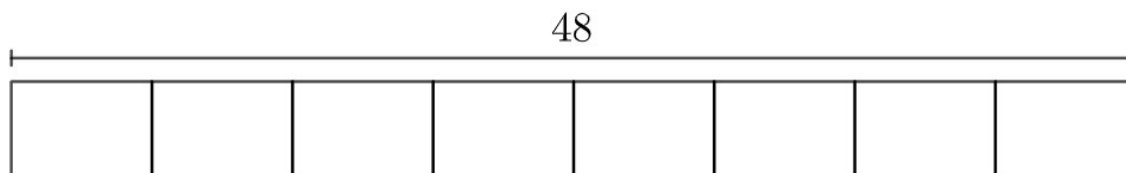
Notice how the computer created the array. Was the only way to show 48 in two long lines of 24?

How else could the array have been created? **6 x 8 or 12 x 4**

How can we use the array shown to find  $\frac{5}{8}$  of 48?

$$\frac{5}{8} \times 48 = \frac{240}{8} = 30$$

*If we hide the circles, doesn't the array look like a tape diagram.  
We will use tape diagrams and number lines today to find fractional parts of a set.*



**LEARN** (35-min)

**Find a Unit Fraction of a Whole Number by Using a Number Line**



**LEARN BOOK PAGE 13**

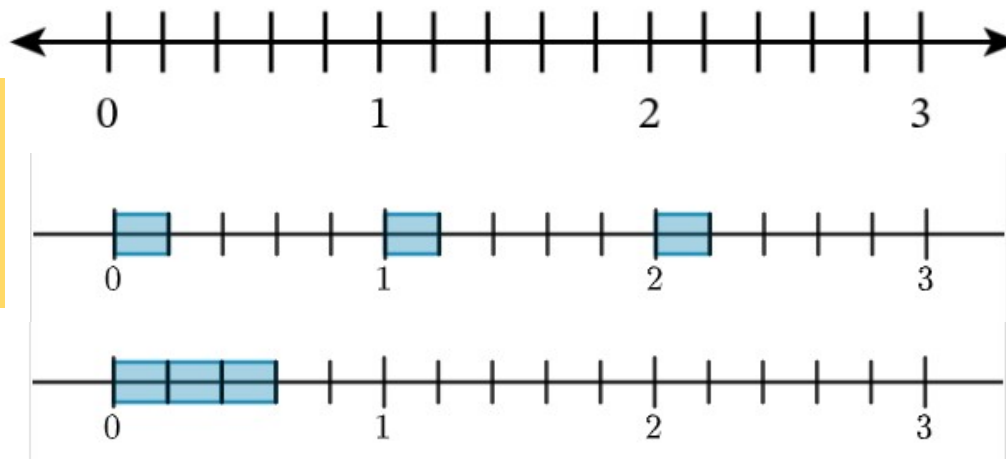
**\*\* Why do you think the book used a number line here and not an array?**

*Even though we could draw a 3-circle array, we cannot partition it into 5 equal parts. A number line allows us to show it. Not every problem can be modeled with an array.*

Find the value by using the number line.

1.  $\frac{1}{5}$  of 3 is \_\_\_\_\_.

*We know  $\frac{1}{5}$  means 1 part of the whole when the whole is partitioned into 5 equal parts. Let's look at how those parts look on a number line:*



*The number line shows  $\frac{1}{5}$  of 3 or  $\frac{1}{5} + \frac{1}{5} + \frac{1}{5}$  or  $\frac{1}{5} \times 3 = \frac{3}{5}$*

$$\frac{1}{5} \times 3 = \frac{3}{5}$$

**LEARN** (35-min)

Find a **Non-Unit Fraction** of a Whole Number by Using a Number Line

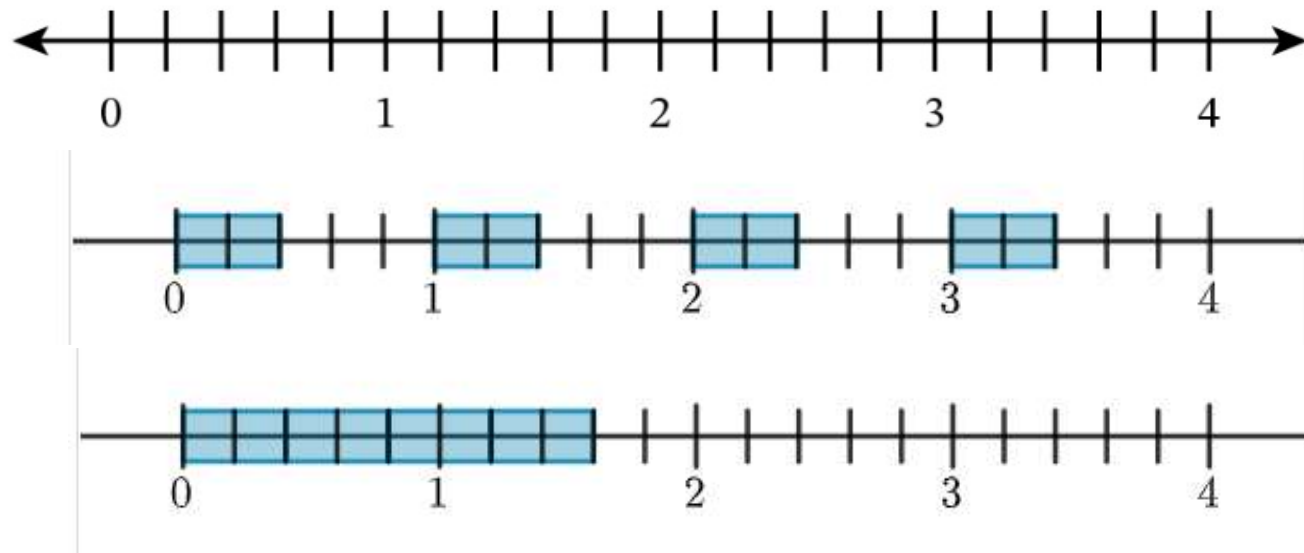
**LEARN BOOK PAGE 13**

Find the value by using the number line.

*To use a number-line, we first show  $\frac{2}{5}$  of each whole number.*

2.  $\frac{2}{5}$  of 4 is \_\_\_\_\_.

*Next, we combine the fractional pieces for our answer.*



$$\frac{2}{5} \times 4 = \frac{8}{5} = 1\frac{3}{5}$$

**LEARN** (35-min)

**Find a Fraction of a Whole Number by Using a Tape Diagram**

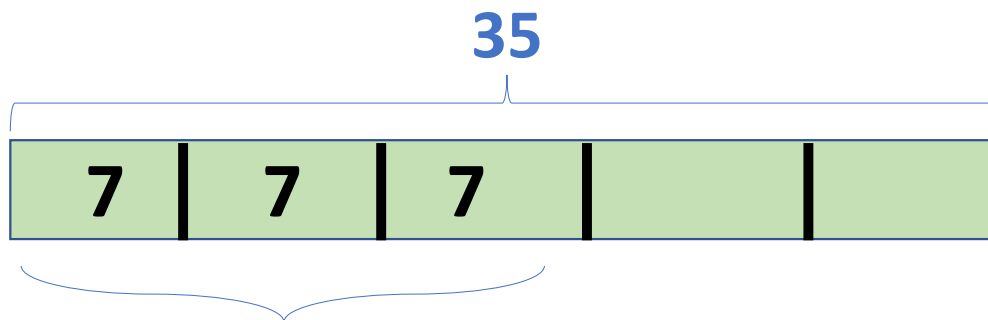
**LEARN BOOK PAGE 13**

Find the value.

3.  $\frac{3}{5}$  of 35 is 21.

*Would it be wise to use an array or a number line to find the value here? Why not?*

*Instead of an array or a number line, let's use a tape diagram.*



$$\frac{3}{5} \times 35 = \frac{105}{5} = 21$$

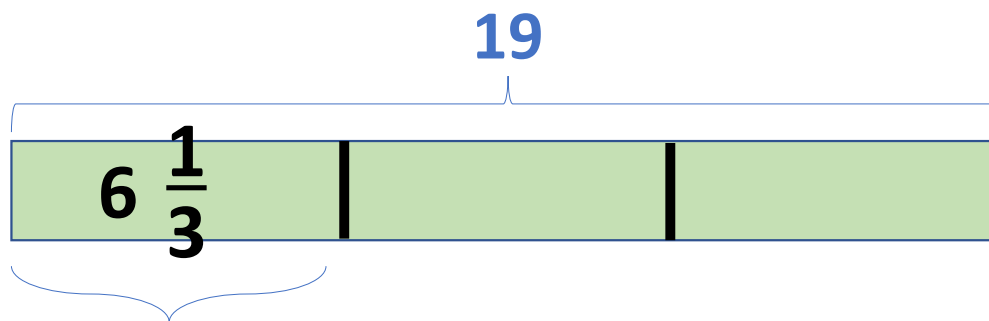
**LEARN** (35-min)

Solve a Real-World Problem

LEARN BOOK PAGE 14

4. Blake has 19 yards of fabric. He uses  $\frac{1}{3}$  of the fabric to make a quilt. How many yards of fabric does Blake use for the quilt?

*Instead of an array or a number line, let's use a tape diagram.*

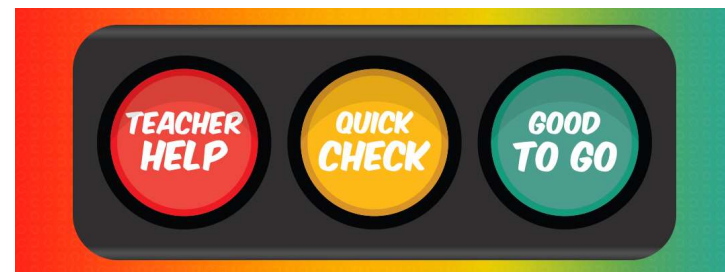


$$19 \div 3 = \frac{19}{3} = 6 \frac{1}{3}$$

$$\frac{1}{3} \times 19 = \frac{19}{3} = 6 \frac{1}{3}$$

**LAND** (10-min)

**Exit Ticket**



Exit Ticket – PAGE 19


**Small Group Time:**

Problem Set Pages 15-18

**Homework:**

Page 15 APPLY BOOK

Name \_\_\_\_\_ Date \_\_\_\_\_

 **2**

Find each value. Show your work by using a tape diagram.

1.  $\frac{1}{5}$  of 5 is \_\_\_\_\_.

2.  $\frac{4}{5}$  of 25 is \_\_\_\_\_.

3.  $\frac{2}{3}$  of 16 is \_\_\_\_\_.