

*Teaching Fractions: Multiple interpretations and  
challenging tasks for Middle & Upper Primary*

MAV 2024

*Hannah Marino & Jane Hubbard*

Mathematical focus:

Recognising the value of fractions greater than 1  
using different representations

## Preliminary experience

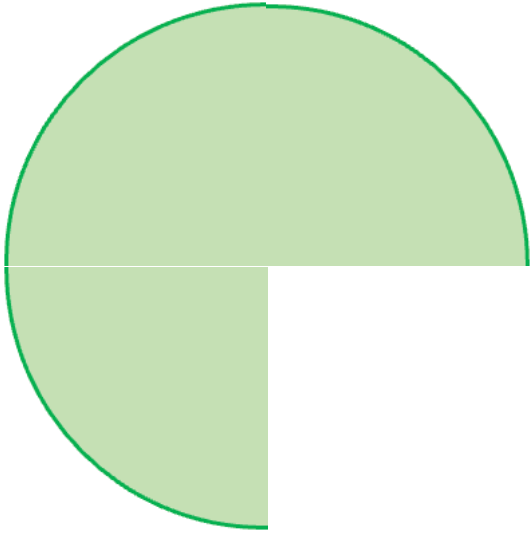
### Dynamic Counting

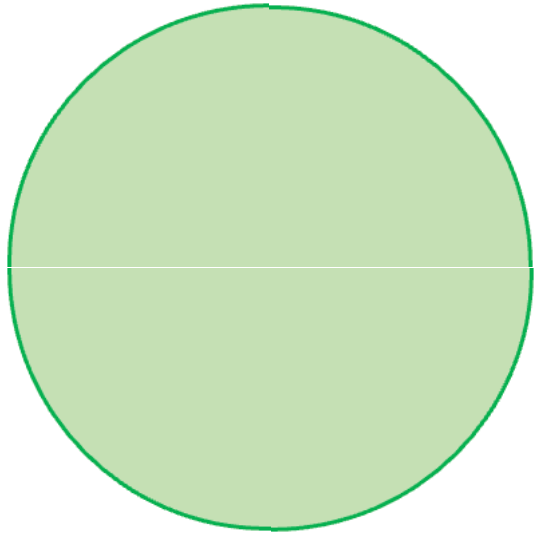
I am going to show you a unit fraction that we are going to count by.

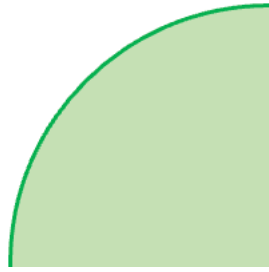
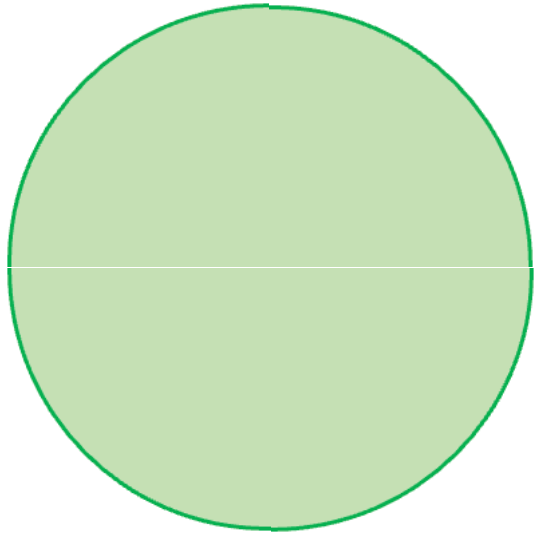
Count along as the image changes on the screen.



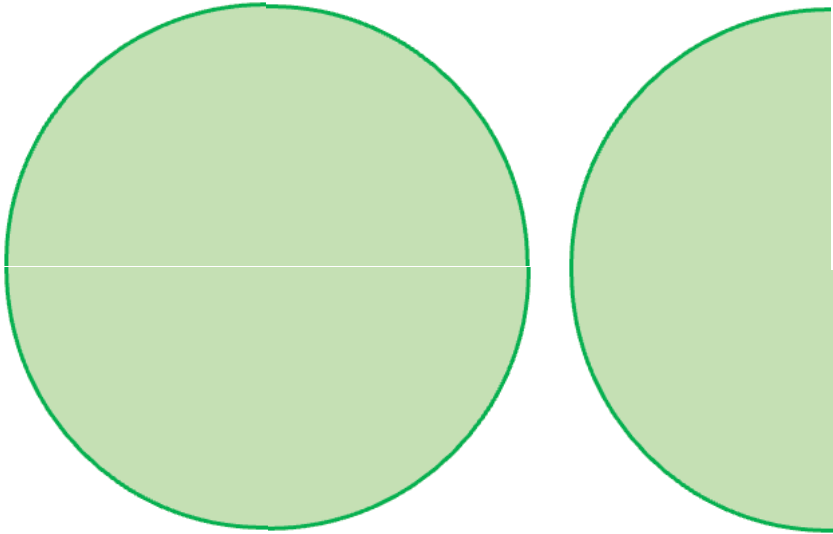


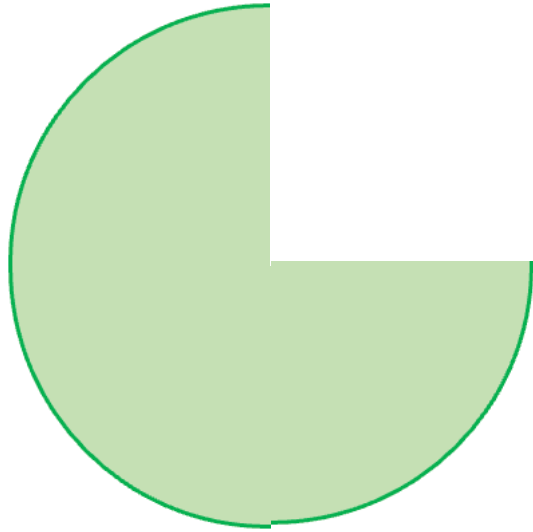
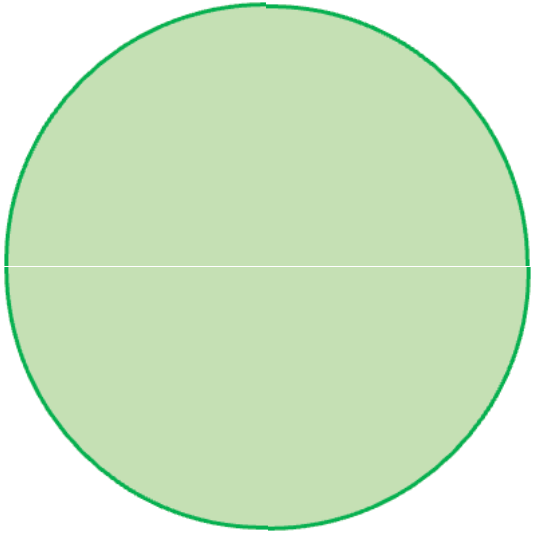


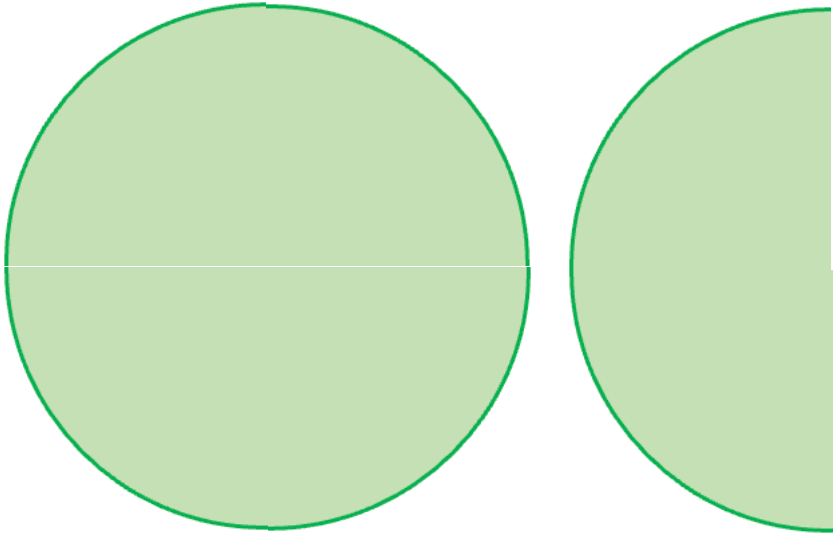


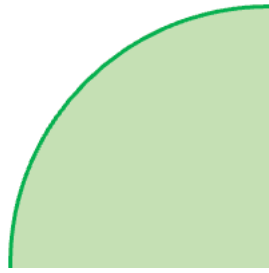
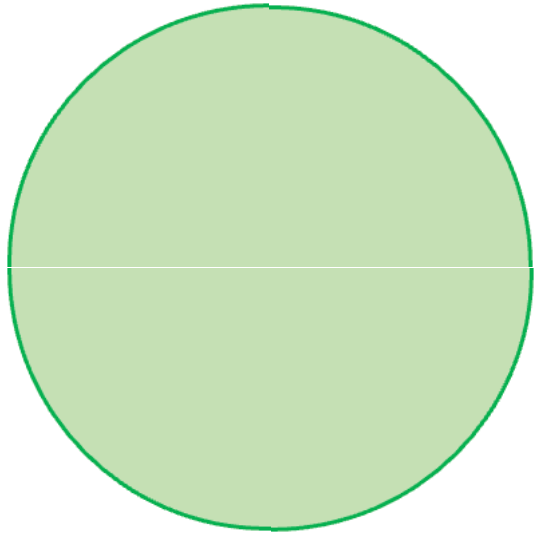


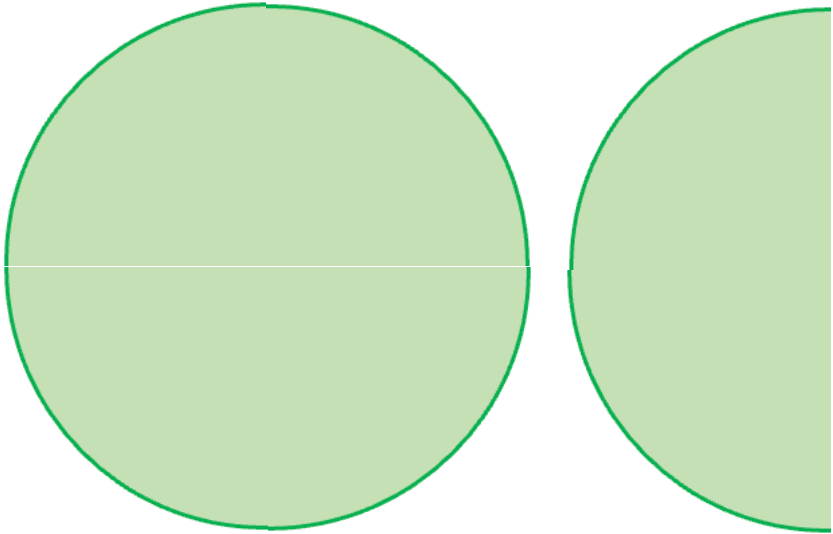


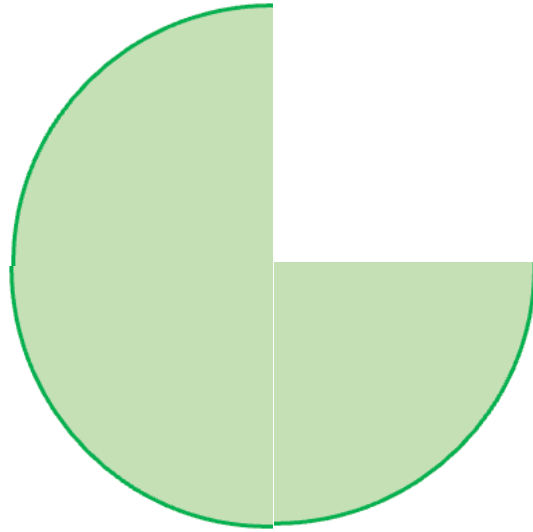
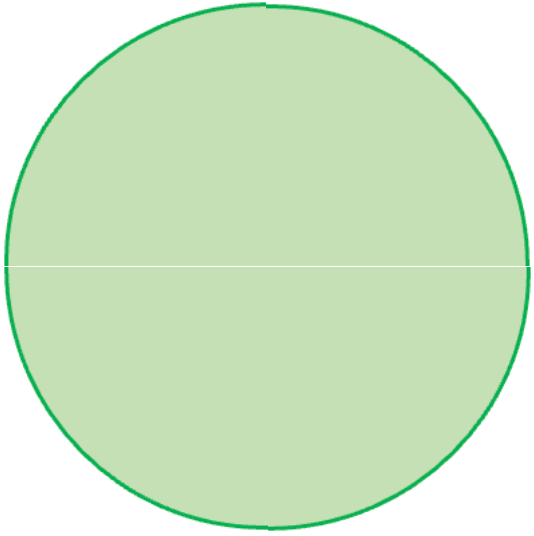


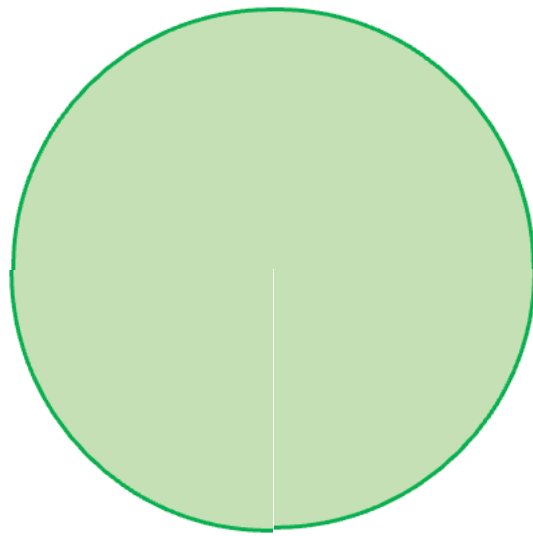
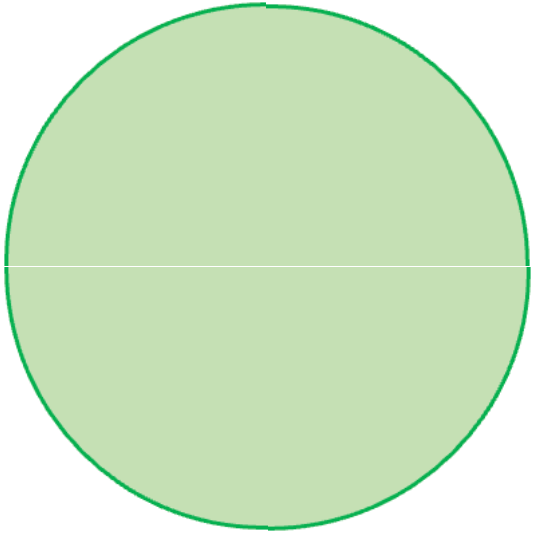


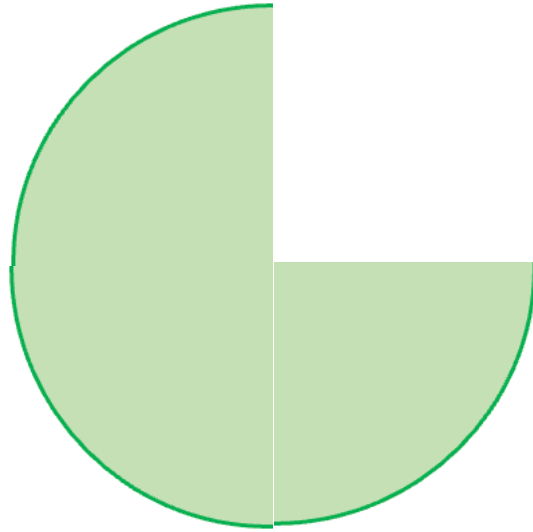
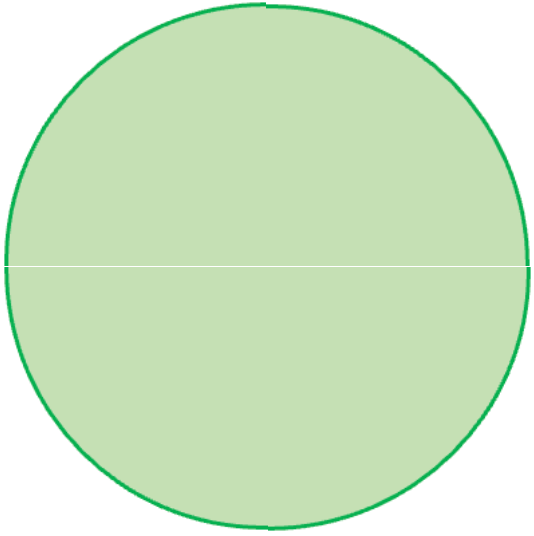




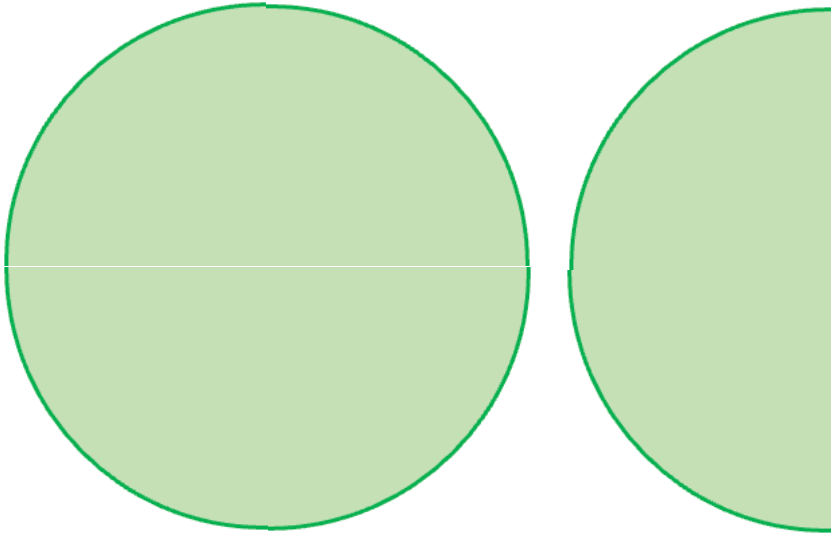


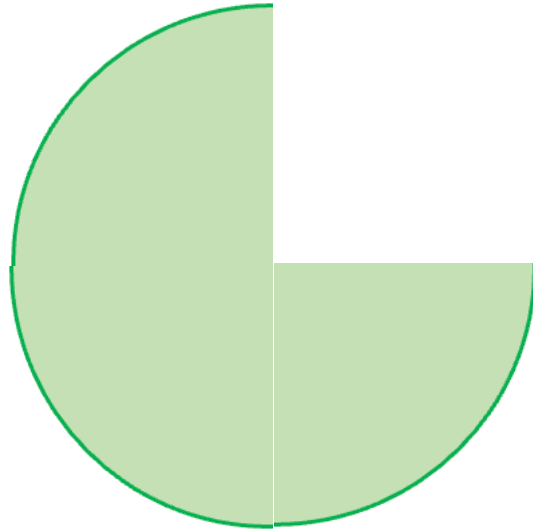
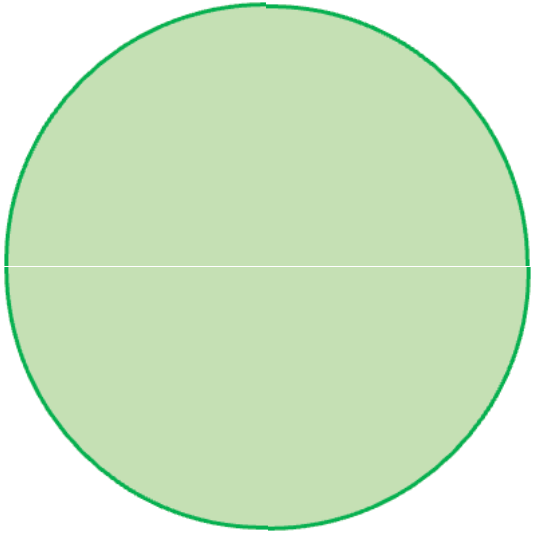


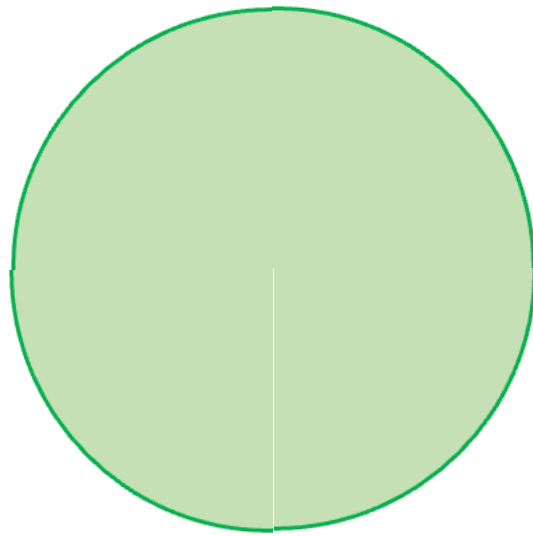
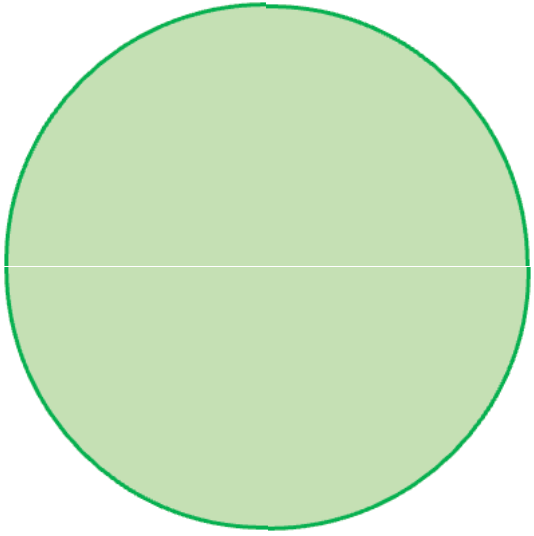


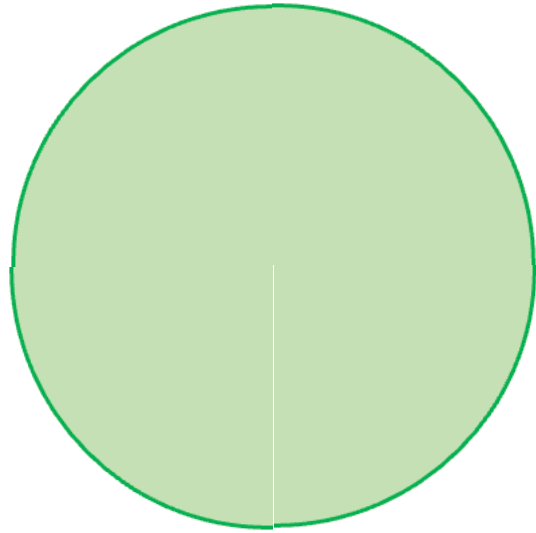
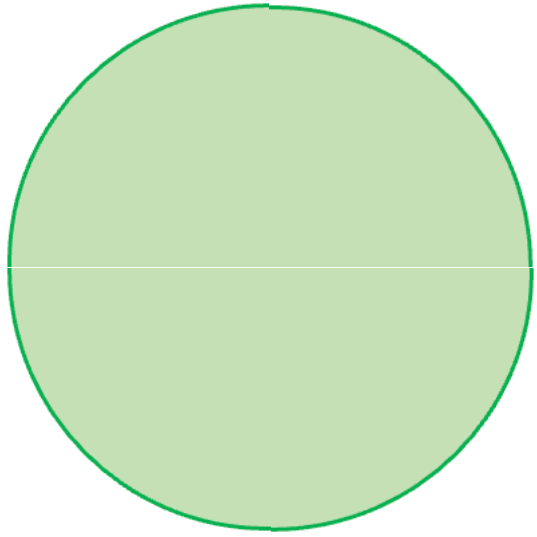


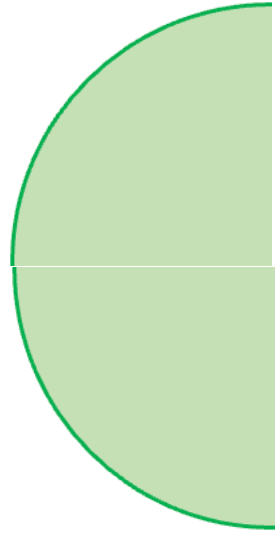
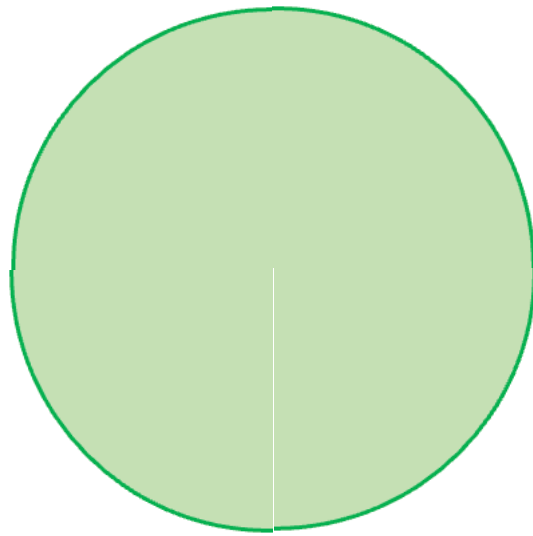
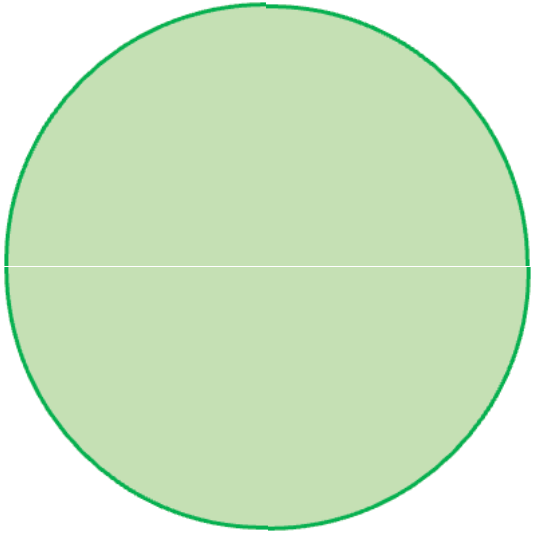


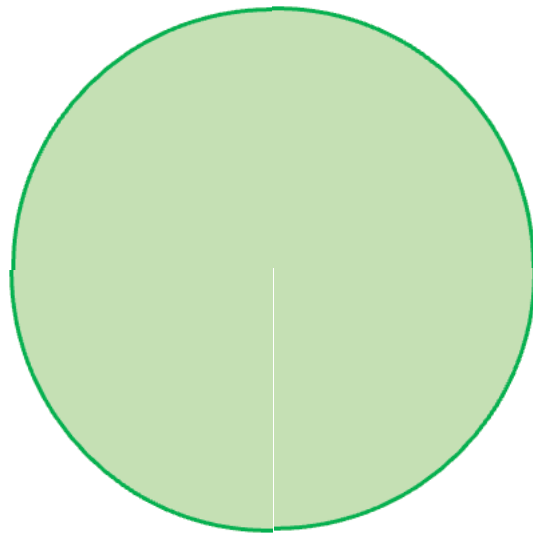
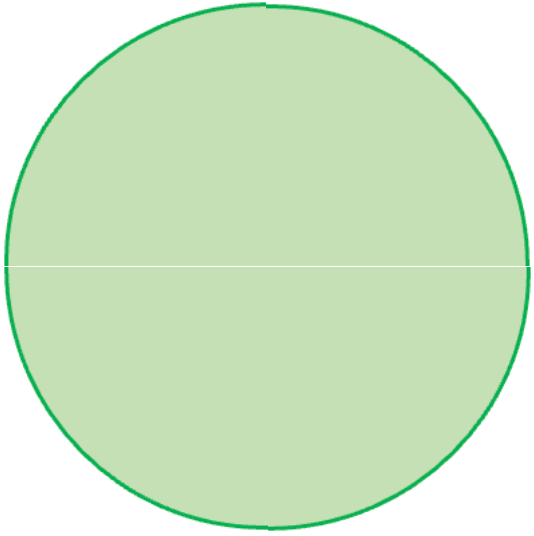


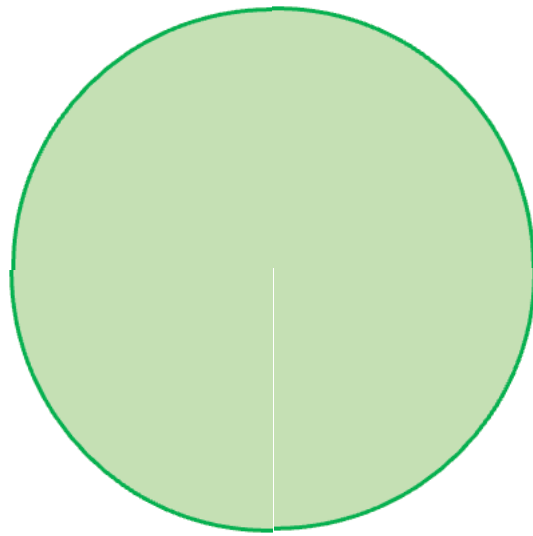
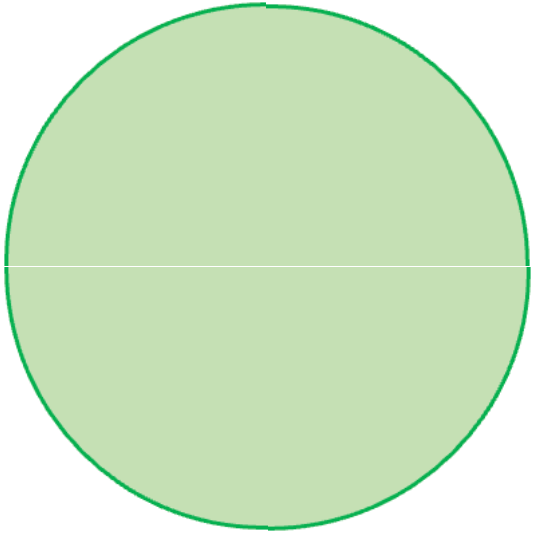


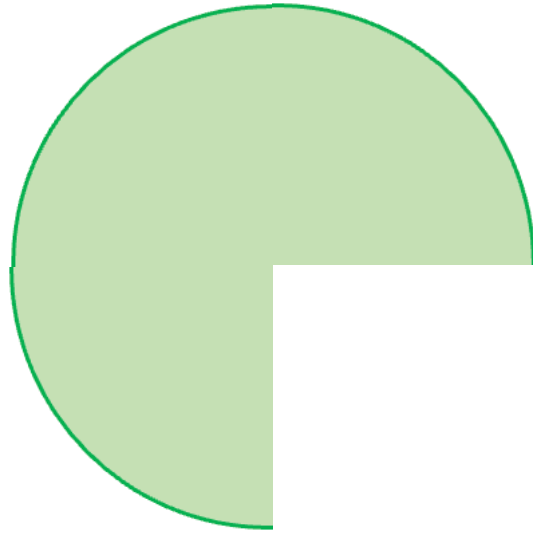
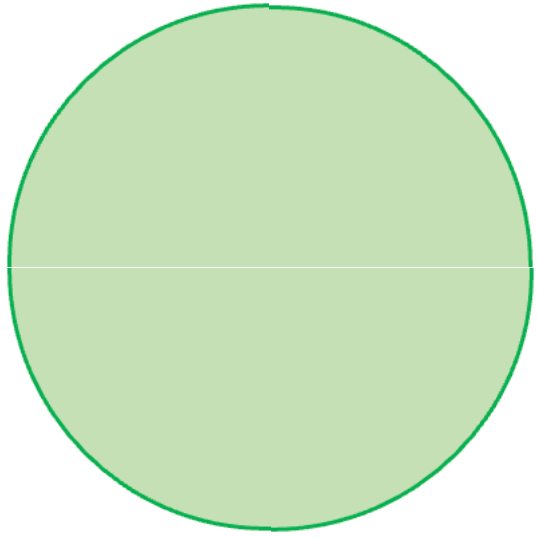




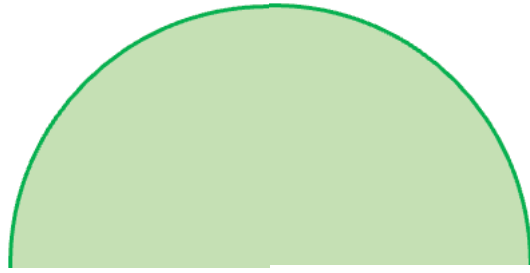
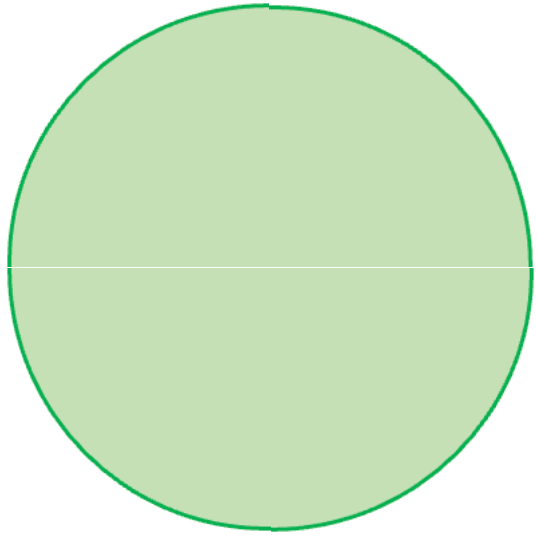


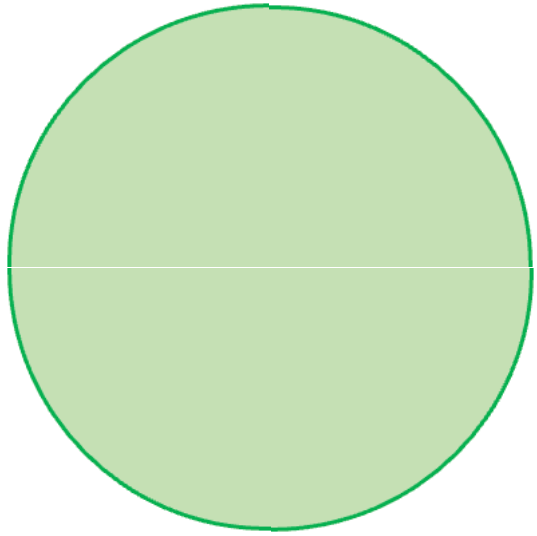


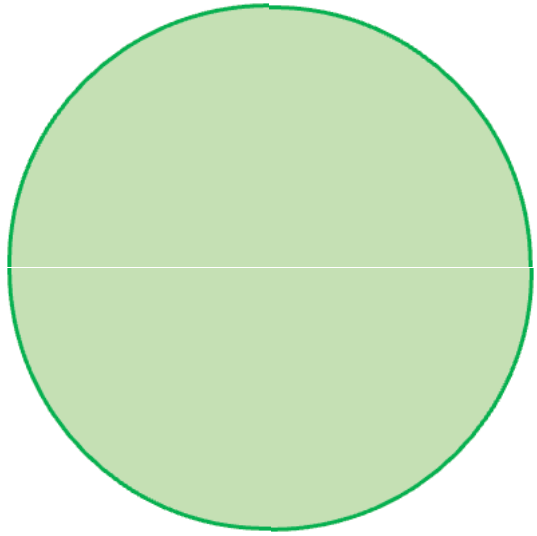


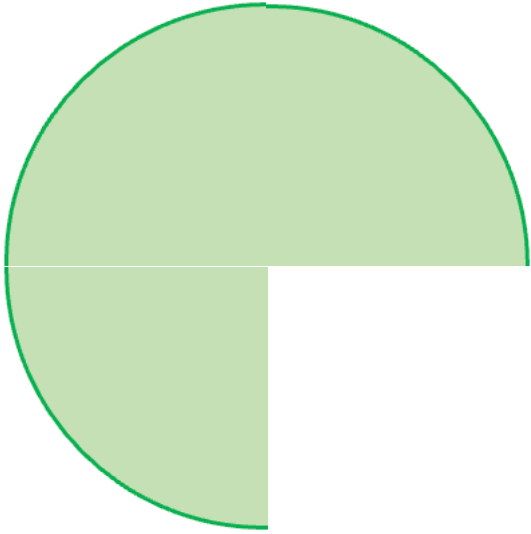




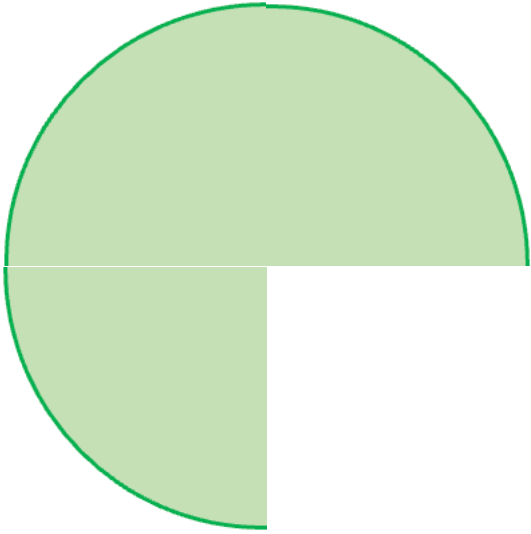


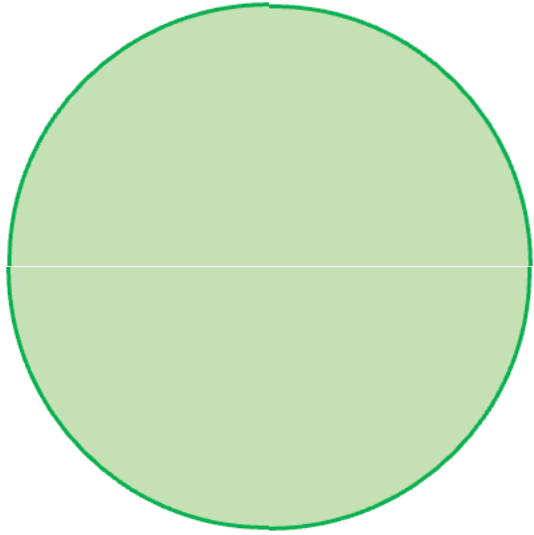


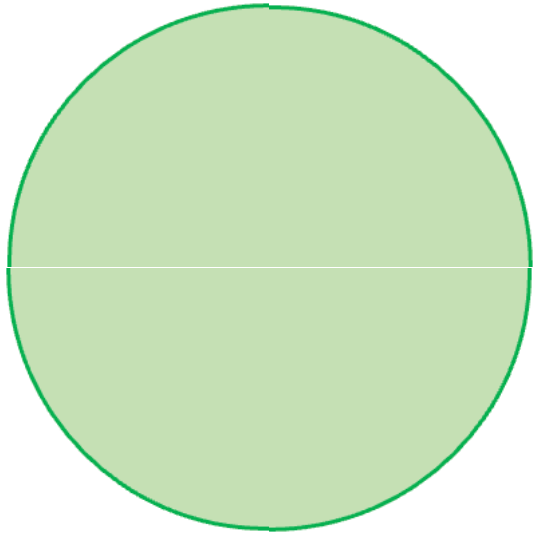




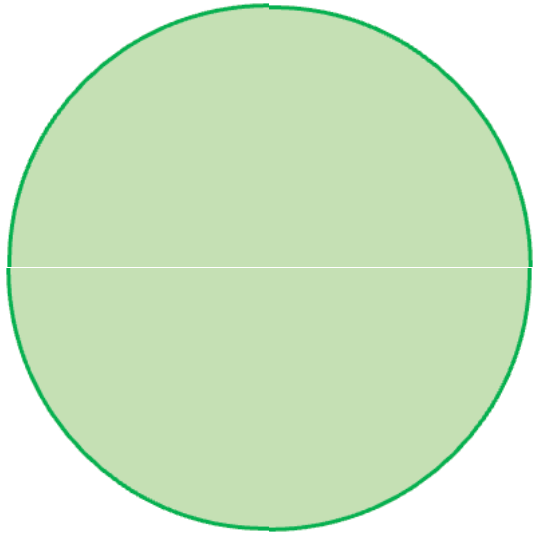


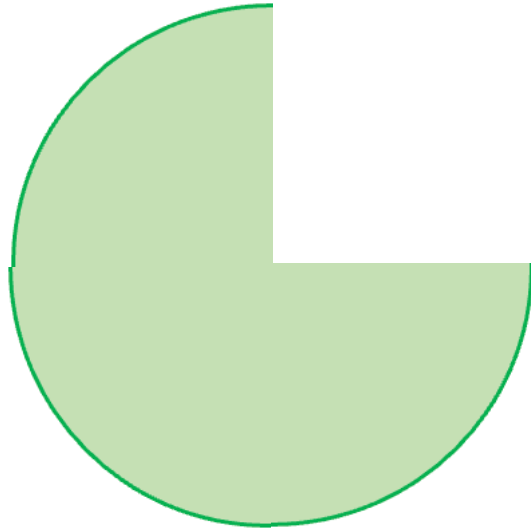
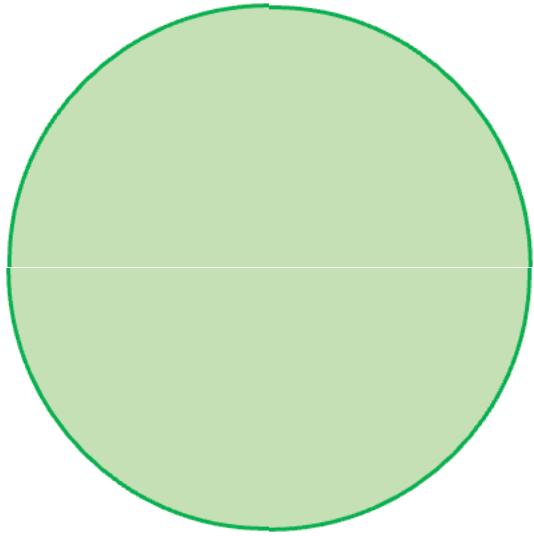








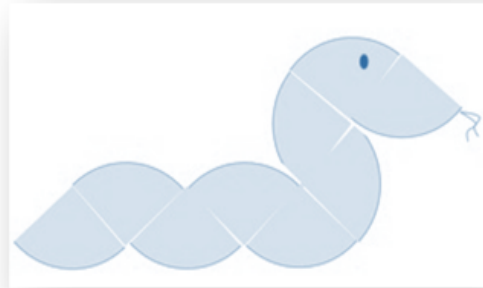




Main Task

## Fraction Animals

In art this week you are making a fraction animal.  
Today we are designing the blueprint for your animal using only the  
fraction pieces in your bag.  
What animal will you create?  
What fraction labels can you include on your blueprint?



## Enabling prompt

Can you make a snake using only quarters?  
How many quarters did you use in total?

## Extending prompt

If I replaced the quarters with eighths, how does the total number of pieces change?

Replace thirds with sixths.

Can you create an animal with multiple fraction parts?

# Consolidation Task

## Ordering fraction animals

In groups of 3 compare the size of your fraction animals.

Who has the largest animal?

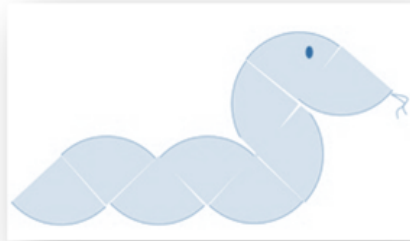
Who has the smallest?

Convince me.

Where would these animals go on a number line?

Can we order all of the class animal blueprints on a fraction number line?

Find different animals that have the same numerical value.





In groups of 3 discuss:



Why do you think it is important to do the task yourselves?

What key questions would you ask to move the students' learning forward throughout the lesson?

How did the preliminary experience connect to the main task?

What was the purpose of the consolidation task?

Where might you take the learning in the next lesson?

# Where might the learning go next?

(you have permission to deviate from the exemplar sequence to be responsive to student learning!)

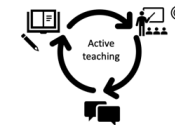
1. Proceed with the suggested sequence as planned



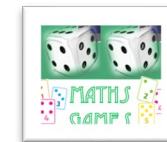
2. Design a new task to focus inspired from student observations in lesson 1



3. Consolidate learning with a game or active instruction



4. Provide further challenge with a game and investigation



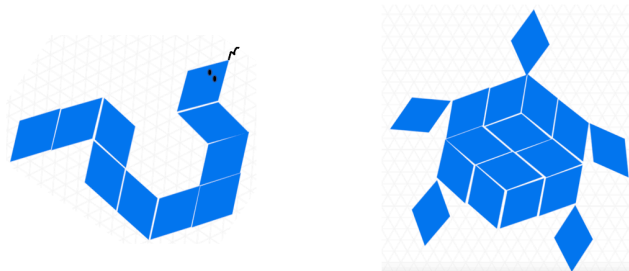
1. Proceed with the suggested sequence as planned



### Suggested task 3

These animals are made out of thirds.  
Where would they go on a number line?

Show me.



Make your own animal out of thirds that would go somewhere between the snake and the turtle.

#### Enabling Prompt

Can you show me one whole on the snake?

How many wholes are there in the snake?

Which numbers would it go between on the number line?

#### Extending Prompt

What if I said these animals were made using quarters.

What is their new value?

## 2. Design a new task to focus inspired from student observations in lesson 1

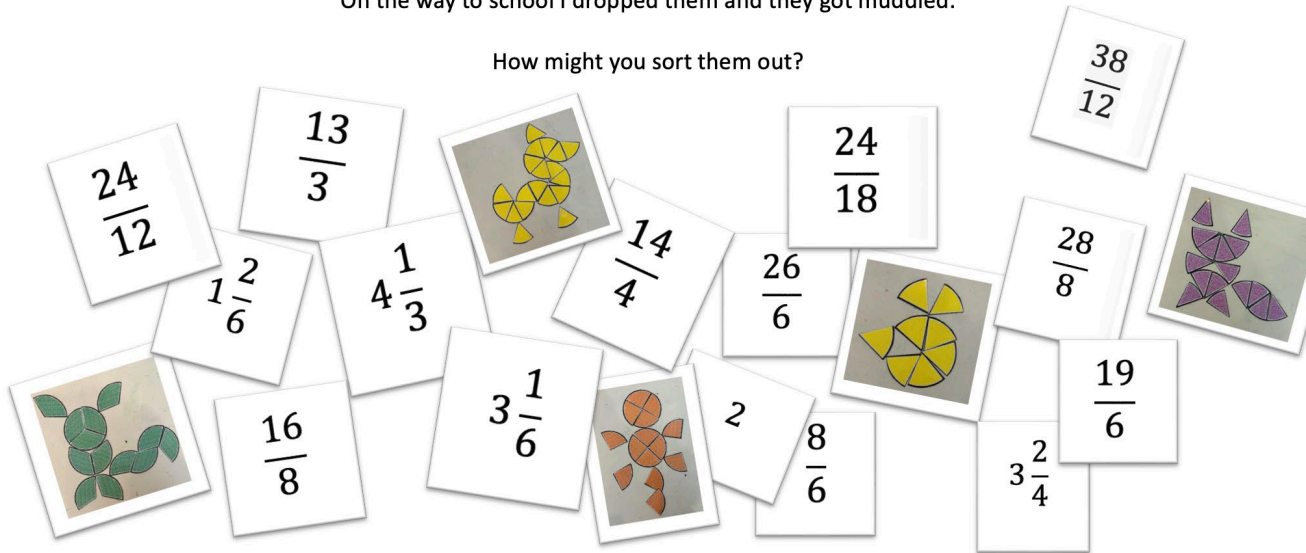


### Card Sort

I worked out different ways to describe the value of some of the fraction animals made yesterday and wrote them onto cards

On the way to school I dropped them and they got muddled.

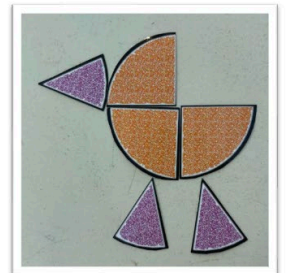
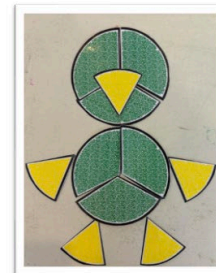
How might you sort them out?



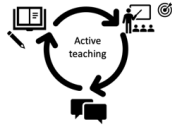
### Extending prompt

I also found these animals but have lost their value.

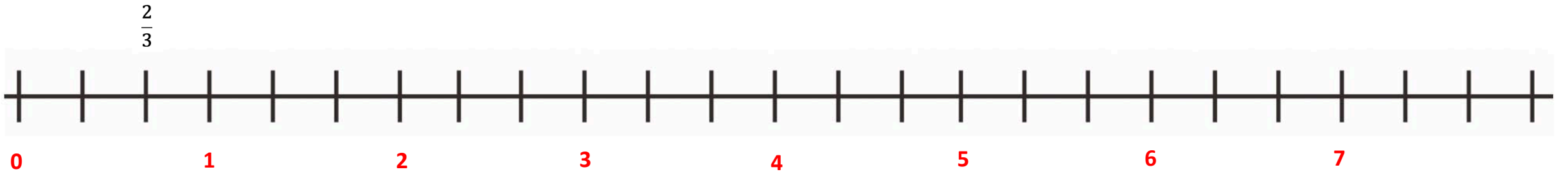
Can you make some cards that would make them also fit the main set?

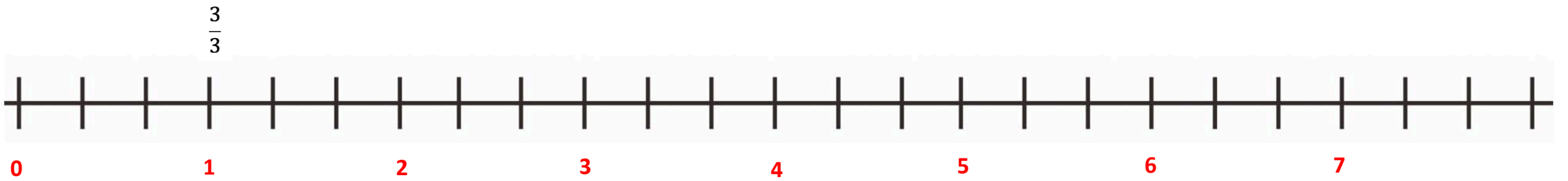


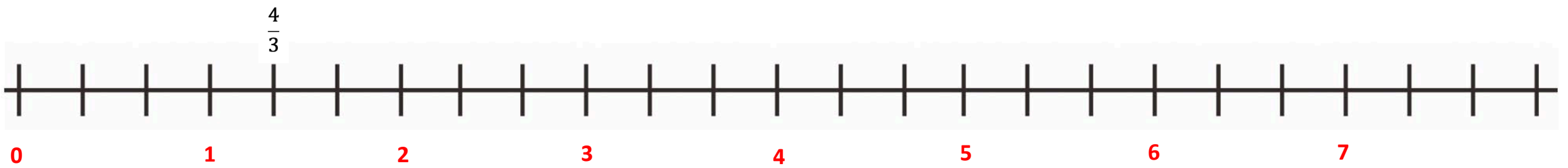
3. Consolidate learning with some active instruction



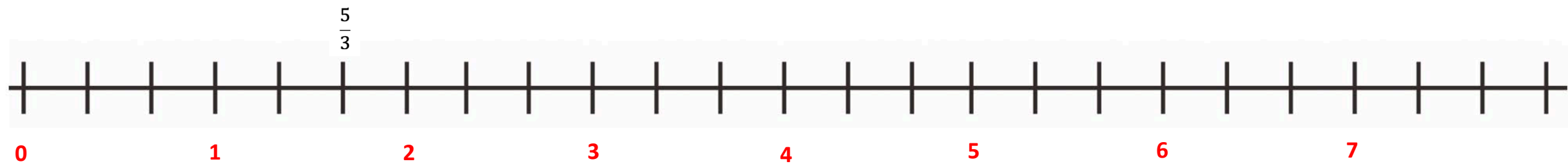
Counting in fraction units on a number line

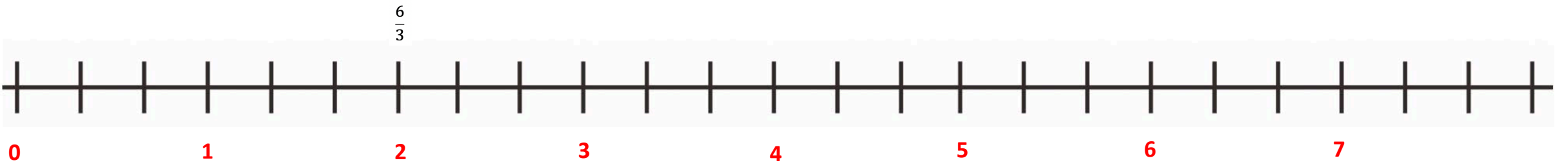












$\frac{7}{3}$



0

1

2

3

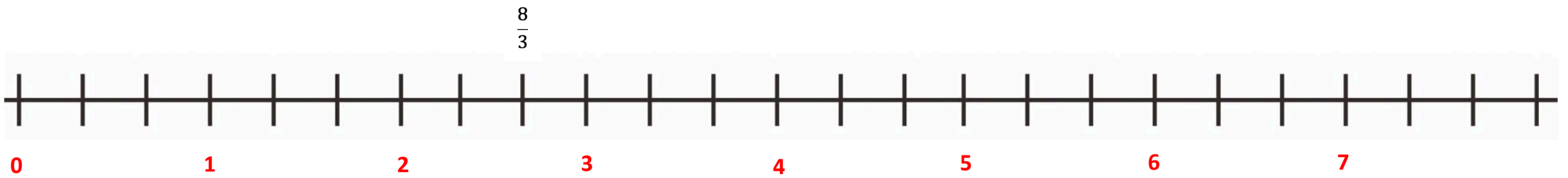
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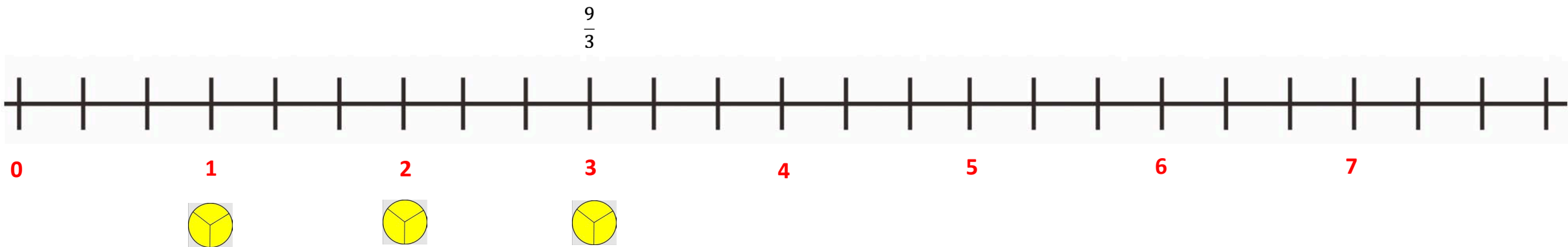
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6

7







$$\frac{10}{3}$$



0

1

2

3

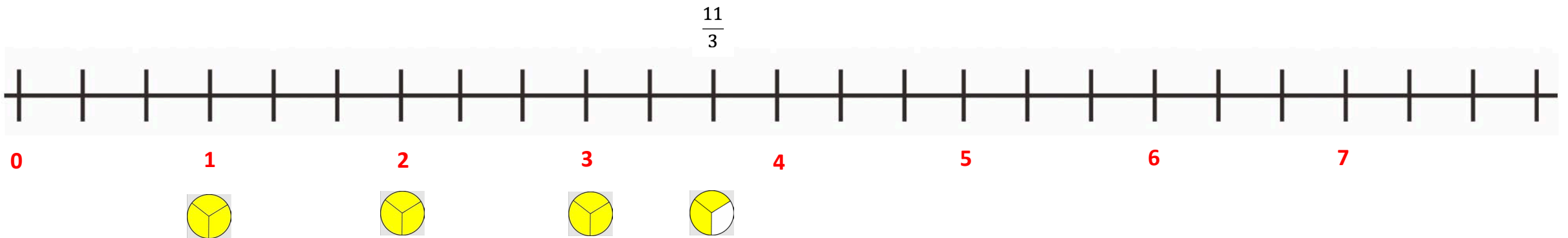
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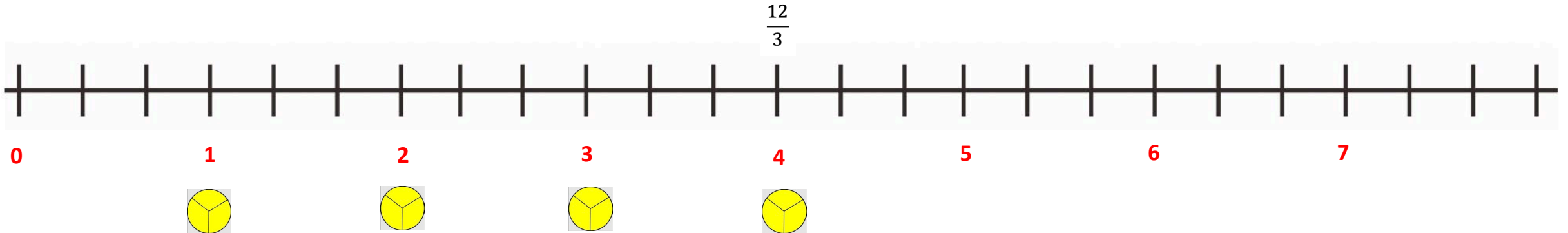
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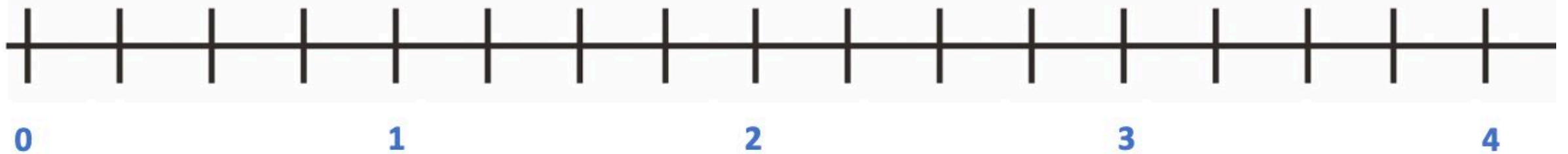
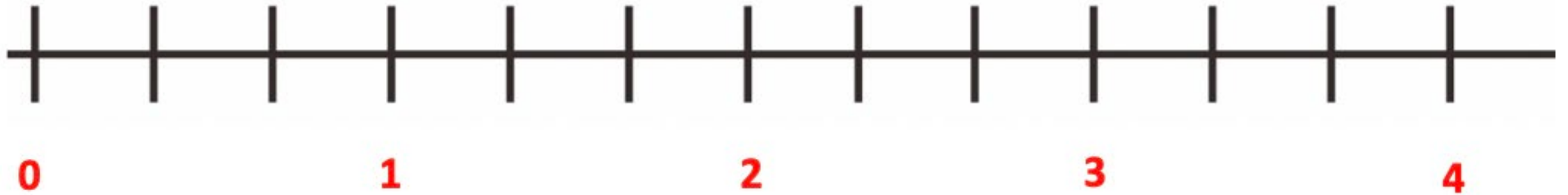






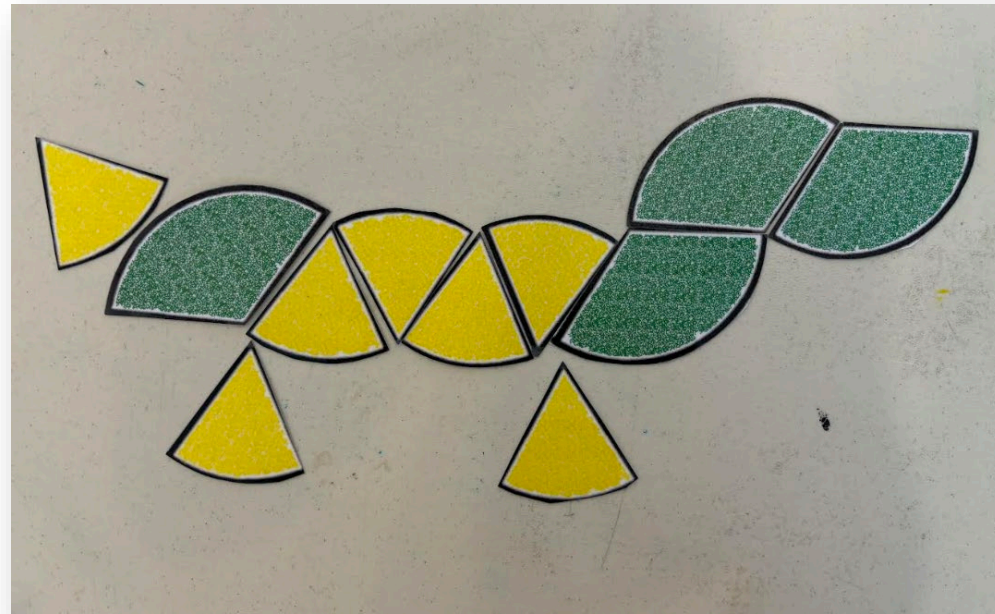
Show me where some of the fraction animals would go on these number lines.

Explain your reasoning.



Where might you place this sausage dog on the number line?

Convince me.



4. Provide further challenge with a game and investigation



# Race to 3

## How to play:

This game is played in pairs.

The object of the game is to be the first person to reach 3.

Players take it in turns to add  $\frac{1}{2}$  or  $\frac{1}{4}$ . A cumulative sum is kept.

Each player must say how much they are adding (either  $\frac{1}{2}$  or  $\frac{1}{4}$ ) and then the total.

The first player starts at 0.

So a sequence in the game might be:

- Player 1:  $\frac{1}{2}$
- Player 2:  $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$
- Player 1:  $\frac{3}{4} + \frac{1}{2} = 1 \frac{1}{4}$

And so on until some reaches 3 and is the winner.

# Extending Investigations

# Race to 3

## Investigation (1)

Play again, however this time, players can either add one-third or one-sixth on their turn.

How does changing the fraction multiple you can add change your strategy?

## Race to 3 Investigation (2)

Play again, however this time, players can either add one-quarter, one-half or three-quarters on their turn.

How does introducing a third option (three-quarters) change your strategy?

# Race to 3

## Investigation (3)

Play again, however this time, roll a dice to decide the target number.

How does changing the target number change your strategy?



# Reflection

Mathematical focus:

Recognising the value of fractions greater than 1  
using different representations

How have the tasks shown in this workshop supported students to develop their understanding of the focus?

What is one think you will take away from this workshop about teaching fractions in middle and upper primary?

Read more here about why these types of experiences are important for students in developing conceptual understanding of unit fractions

# A fraction sequence for the middle years: Introducing students to multiple interpretations of fractions through a challenging tasks approach



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# Q & A

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Don't forget to give us your feedback!

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