

# Reasoning and Problem Solving

## Step 6: Fractions on a Number Line

### National Curriculum Objectives:

Mathematics Year 3: (3F1c) [Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators](#)

### Differentiation:

Questions 1, 4 and 7 (Reasoning)

**Developing** Create and use a number line to represent fractions more than one. Counting forwards only, using halves, thirds and quarters.

**Expected** Create and use a number line to represent fractions more than one. Counting forwards or backwards, using various fractions up to tenths.

**Greater Depth** Create and use a number line to represent fractions more than one as part of a two-step problem. Counting forwards and backwards, using various fractions up to tenths.

Questions 2, 5 and 8 (Problem Solving)

**Developing** Use a blank number line to represent a person's journey with one stop. Fractions up to one, using halves, thirds and quarters.

**Expected** Use a blank number line to represent a person's journey with two stops. Fractions up to one.

**Greater Depth** Use a blank number line to represent a person's journey with multiple stops. Fractions up to one.

Questions 3, 6 and 9 (Reasoning)

**Developing** Explain a misconception about the use of a number line to represent fractions more than one using halves, thirds and quarters. Images given to support.

**Expected** Explain a misconception about the use of a number line to represent fractions more than one using various fractions up to tenths. All divisions on the number line marked and labelled. No images given.

**Greater Depth** Explain a misconception about the use of a number line to represent fractions more than one, using various fractions up to tenths. Not all divisions on the number line marked or labelled for the given fraction. No images given.

More [Year 3 Fractions](#) resources.

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# Fractions on a Number Line

# Fractions on a Number Line

1a. Urooj says,



If I start on 1 and count on 1 half, I will end up on 3.

Draw a number line to work out if she is correct. Explain your answer.



R

1b. Simon says,



If I start on 1 and count on 2 more quarters, I will end up on 2.

Draw a number line to work out if he is correct. Explain your answer.



R

2a. Cheng runs in a race.

He falls over when he is  $\frac{1}{3}$  of the way to the finishing line.



Show Cheng's race on the blank number line.



PS

2b. Julia walks to the library.

She stops to pick up a book that she drops when she is  $\frac{1}{4}$  of the way there.

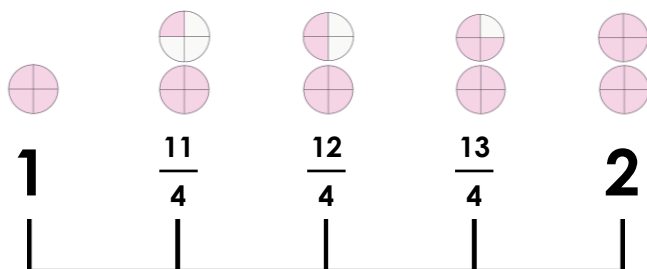


Show Julia's journey on the blank number line.



PS

3a. Stefan thinks he has labelled this number line correctly.

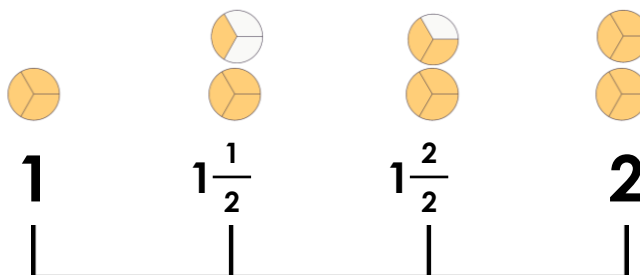


Is he correct? Explain how you know.



R

3b. Chloe thinks she has labelled this number line correctly.



Is she correct? Explain how you know.



R

# Fractions on a Number Line

# Fractions on a Number Line

4a. Dan says,



If I start on  $2\frac{1}{4}$  and count back 5 quarters, I will end up on 0.

Draw a number line to work out if he is correct. Explain your answer.



R

4b. Nadiya says,



If I start on  $1\frac{3}{6}$  and count on 6 sixths, I will end up on 2.

Draw a number line to work out if she is correct. Explain your answer.



R

5a. Lin walks to school.

She rests when she is  $\frac{2}{6}$  of the way there. At  $\frac{5}{6}$  of the way there, she stops to chat to a friend.

Home School

Show Lin's journey on the blank number line.



PS

5b. Ali rides his bike to his gran's house.

He has a puncture when he is  $\frac{2}{8}$  of the way there. At  $\frac{6}{8}$  of the way there, he stops to have a drink.

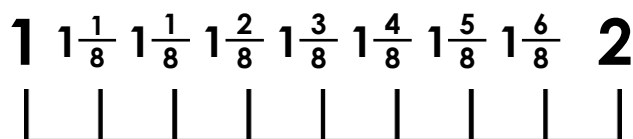
Home Gran's house

Show Ali's journey on the blank number line.



PS

6a. Harkiran thinks she has labelled this number line correctly.

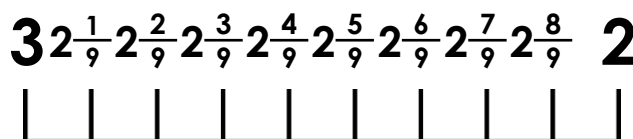


Is she correct? Explain how you know.



R

6b. Filip thinks he has labelled this number line correctly.



Is he correct? Explain how you know.



R

# Fractions on a Number Line

# Fractions on a Number Line

7a. Alice says,



If I start on  $1\frac{7}{8}$  and count back 4 eighths, then count on  $\frac{3}{8}$ , I will end on 2.

Draw a number line to work out if she is correct. Explain your answer.



R

7b. Zain says,



If I start on  $2\frac{4}{5}$  and count on 5 more fifths, then count back  $\frac{4}{5}$ , I will end on 2.

Draw a number line to work out if he is correct. Explain your answer.



R

8a. Jakub rides his scooter to the shop.

He falls off when he is  $\frac{2}{10}$  of the way there. At  $\frac{5}{10}$  of the way there, he stops to chat to a friend. At  $\frac{8}{10}$  of the way there, he stops to have a drink.

Home Shop

Show Jakub's journey on the blank number line.



PS

8b. Zara walks home from the park.

She stops to buy an ice-cream when she is  $\frac{3}{9}$  of the way there. At  $\frac{6}{9}$  of the way home, she stops to have a drink. At  $\frac{8}{9}$  of the way there, she waves to her friend.

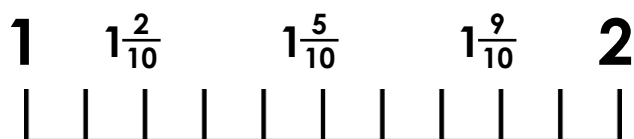
Park Home

Show Zara's journey on the blank number line.



PS

9a. Matthew thinks he has labelled this number line correctly.

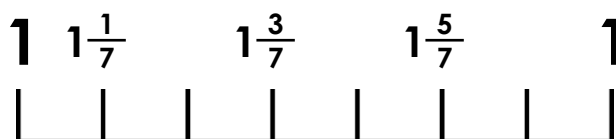


Is he correct? Explain how you know.



R

9b. Zuzanna thinks she has labelled this number line correctly.



Is she correct? Explain how you know.

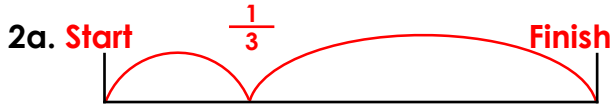


R

## Reasoning and Problem Solving Fractions on a Number Line

### Developing

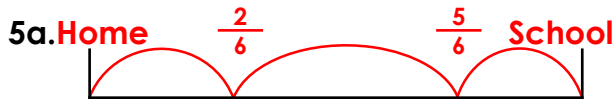
1a. No, she will end on  $1\frac{1}{2}$ .



3a. No, the whole digit should come before the fraction, not as part of the numerator.

### Expected

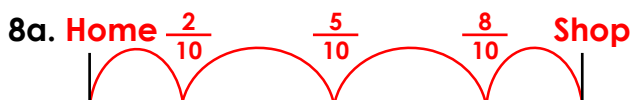
4a. No, he will end up on 1.



6a. No,  $1\frac{1}{8}$  has been labelled twice, meaning that the following fractions are incorrect.

### Greater Depth

7a. No, she will end up on  $1\frac{6}{8}$ .

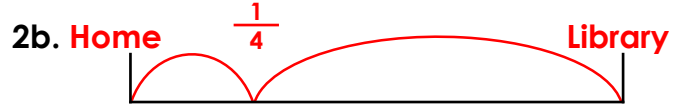


9a. No, he should have labelled  $1\frac{8}{10}$  instead of  $1\frac{9}{10}$ .

## Reasoning and Problem Solving Fractions on a Number Line

### Developing

1b. No, he will end on  $1\frac{2}{4}$ .



3b. No, the number line is split into 3 equal parts and the images show thirds, not halves.

### Expected

4b. No, she will end up on  $2\frac{3}{6}$ .



6b. No, the whole numbers '3' and '2' are in the wrong positions on the number line.

### Greater Depth

7b. No, he will end up on 3.



9b. No, the number line should end on '2', not '1'.