

Understand improper fractions

Notes and guidance

Children should now be confident with the idea that fractions can be greater than 1 and have experienced these as mixed numbers. In this small step, they write them as improper fractions – a fraction where the numerator is greater than or equal to the denominator.

From previous learning, children know that when the numerator is equal to the denominator, the fraction is equal to 1 whole. That knowledge is extended to exploring other integers using knowledge of times-tables. For example, if children know that $\frac{3}{3}$ is equal to 1, they can repeat groups of $\frac{3}{3}$ to see that $\frac{6}{3} = 2$ and $\frac{9}{3} = 3$. They then explore the improper fractions that lie between whole numbers. Bar models and number lines support this understanding.

At this point, children do not need to formally convert between improper fractions and mixed numbers, but they may begin to explore the relationships between them by plotting both on a number line.

Things to look out for

- Children may not have seen fractions where the numerator is greater than the denominator before, which may have led to misconceptions about this not being possible.

Key questions

- How many _____ (for example, thirds) are there in 1 whole?
- So how many _____ (for example, thirds) will there be in $\frac{2}{3}$ / $\frac{4}{3}$ wholes?
- What do you think comes next in this count: 3 fifths, 4 fifths, 5 fifths?
- What is the same about mixed numbers and improper fractions? What is different?
- If there are 10 tenths in 1 whole, how many tenths are there in $1\frac{1}{10}$?
- Which of these are improper fractions? How do you know?

Possible sentence stems

- An improper fraction is a fraction where the numerator is _____ the denominator.
- There are _____ _____ in 1 whole, so there are _____ _____ in $\frac{2}{3}$ / $\frac{4}{3}$ wholes.

National Curriculum links

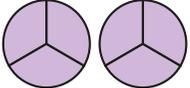
- This small step is not taken from the Year 4 National Curriculum. It is included to take into account the non-statutory DfE Ready to Progress guidance.

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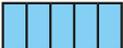
Key learning

- Fill in the missing numbers.

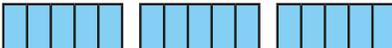
▶  $\frac{3}{3} = \underline{\quad}$ whole

▶  $\frac{6}{3} = \underline{\quad}$ wholes

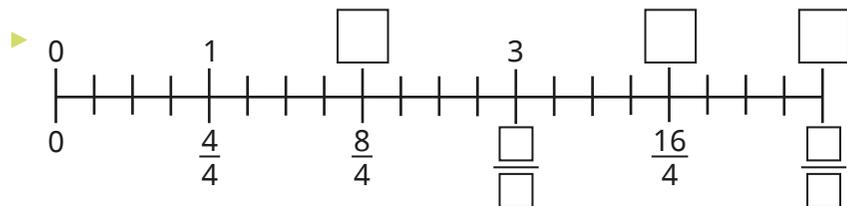
▶  $\frac{9}{3} = \underline{\quad}$ wholes

▶  $\frac{5}{5} = \underline{\quad}$ whole

▶  $\frac{10}{5} = \underline{\quad}$ wholes

▶  $\frac{\square}{5} = 3$ wholes

▶  $\frac{\square}{\square} = \underline{\quad}$ wholes



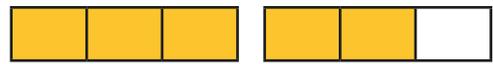
What do you notice?

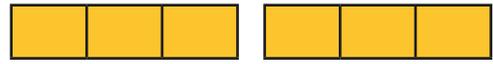
- Fill in the missing numbers.

▶ $\frac{4}{2} = \underline{\quad}$ ▶ $\frac{10}{2} = \underline{\quad}$ ▶ $\frac{\square}{2} = 10$

▶ $\frac{30}{10} = \underline{\quad}$ ▶ $6 = \frac{\square}{10}$ ▶ $\frac{110}{10} = \underline{\quad}$

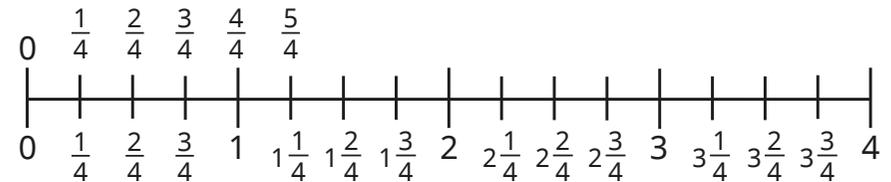
- What improper fractions are shown in the diagrams?

▶ 

▶ 

▶ 

- Complete the number line by counting in improper fractions.



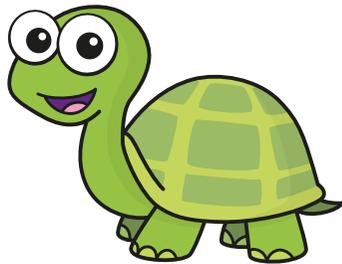
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Reasoning and problem solving

Tiny is talking about improper fractions.



If $\frac{4}{4}$ is equal to 1,
then $\frac{5}{4} = 2$,
 $\frac{6}{4} = 3$ and $\frac{7}{4} = 4$



Do you agree with Tiny?
Explain your reasons.



No

Use the digit cards to make as many improper fractions as you can.



Which of the improper fractions are greater than 1 and less than 2?

Which of the improper fractions are greater than 2 and less than 3?

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

$\frac{5}{2}, \frac{7}{3}, \frac{8}{3}$