

## Addition and subtraction

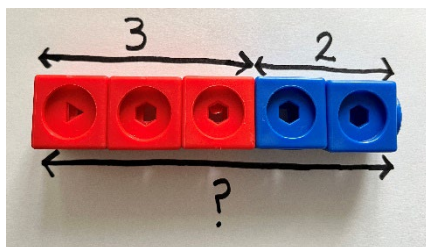
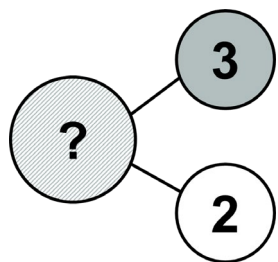
At this stage, children should be exposed to different models of addition and subtraction. It is important that they develop deep understanding of how addition and subtraction are related to each other – focus on language and how one model can be interpreted in many ways.

- Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
- Represent and use number bonds and related subtraction facts within 20
- Add and subtract one-digit and two-digit numbers to 20, including zero
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as  $7 = \square - 9$

## Addition

**Aggregation** (two quantities combined)

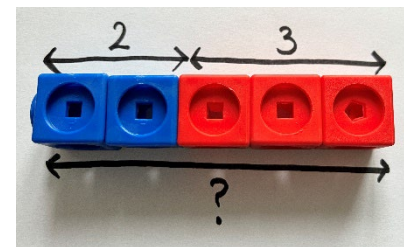
*Three yellow sweets and two red sweets are on the table. How many sweets are on the table?*



$$3 + 2 = 5 \quad 5 = 2 + 3$$

$$5 = 3 + 2 \quad 2 + 3 = 5$$

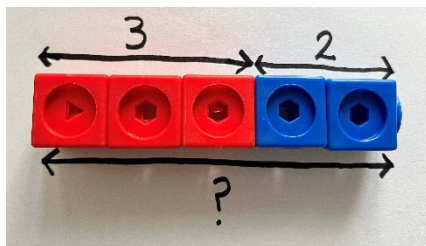
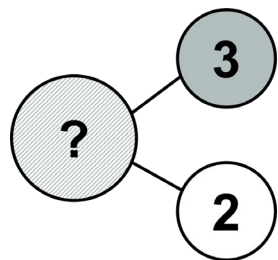
Three add two equals five.



Two add three equals five.

**Augmentation** (one quantity is increased)

*There were three sweets on the table. Two more have been put on. How many sweets are on the table now?*



$$3 + 2 = 5$$

$$5 = 3 + 2$$

Three and two more makes five.

# Multiplication and division

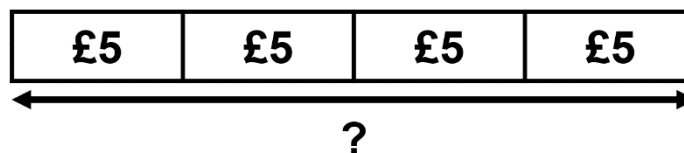
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x) and division (÷) and equals (=) signs
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts

## Multiplication (equal groups)

James buys four tickets for the football match. Each ticket costs £5. How much does he spend?

$$£5 + £5 + £5 + £5 = £20$$

$$4 \times £5 = £20$$



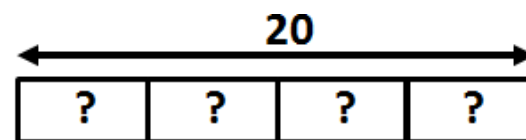
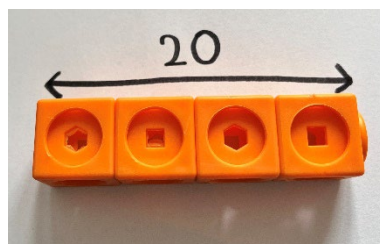
Four groups of £5 is £20.  
£5 four times is £20.

It is important that children start to understand unitisation at this point.

## Division (sharing)

There are 20 children in the hall. The teacher wants to put the children into 4 equal teams. How many children will be in each team?

$$20 \div 4 = 5$$

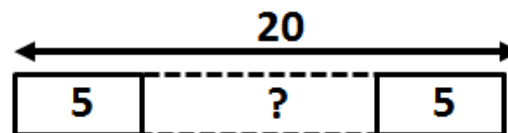
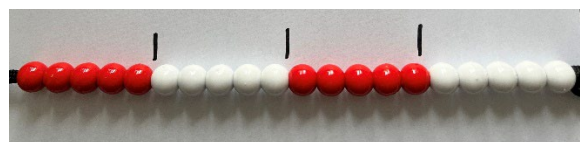


20 shared equally between 4 groups  
results in 5 in each group.

## Division (grouping)

Claire wants to put 5 biscuits on each plate. She has 20 biscuits. How many plates does she need?

$$20 \div 5 = 4$$

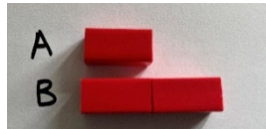


There are 4 groups of 5 in 20.

# Multiplication and division

- Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which  $n$  objects are connected to  $m$  objects

At this stage, focus upon the multiplicative relationship between the bars.



What do you notice?

... is twice as many as ...

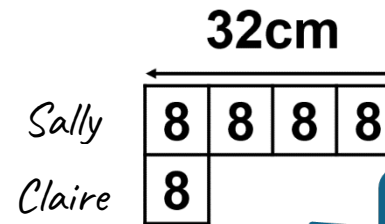
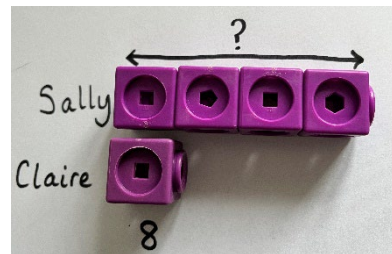
... is three times as many as ...

... is three times smaller than ...



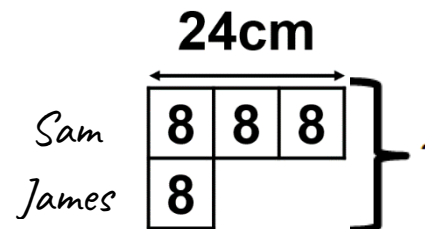
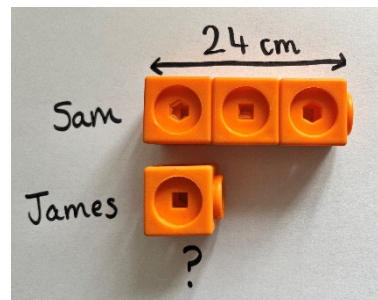
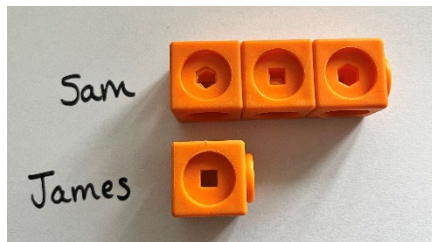
Can you change this model to show that C is four times as big as D?

Claire builds a tower that is 8 cubes tall. Sally builds a tower that is 4 times as tall. How tall is Sally's tower?



How much smaller is Claire's tower than Sally's tower?

Sam's ribbon is three times as long as James's ribbon. Sam's ribbon is 24cm long. How long is James's ribbon?

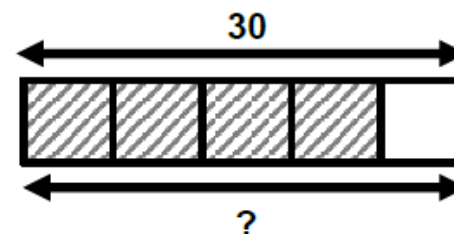
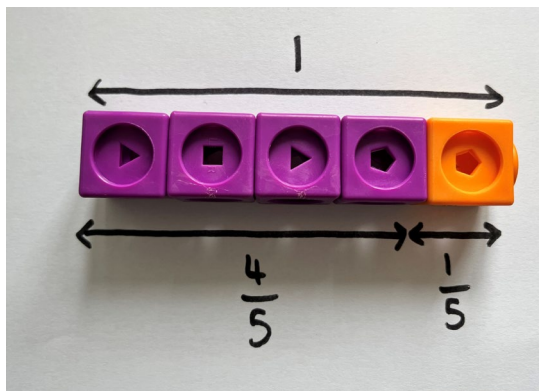


What is the total length of the ribbons?

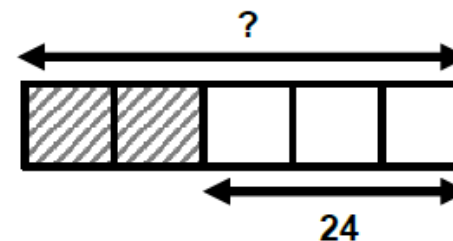
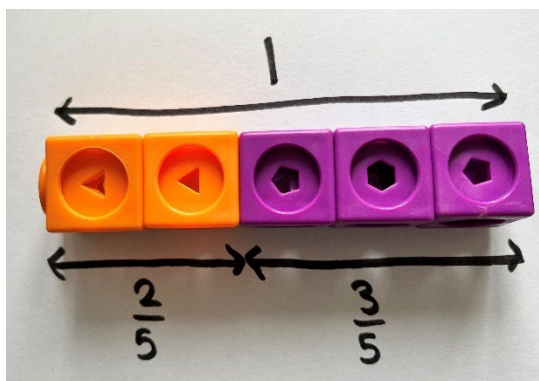
# Fractions

- Recognise and show, using diagrams, families of common equivalent fractions ([click to see Year 3 progression](#))
- Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number (see models below)
- Add and subtract fractions with the same denominator ([click to see Year 3 progression](#))

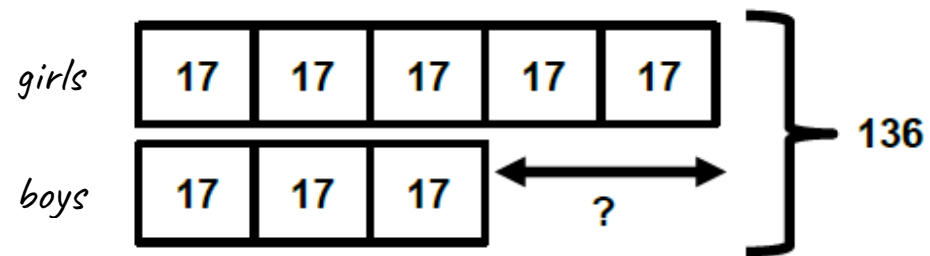
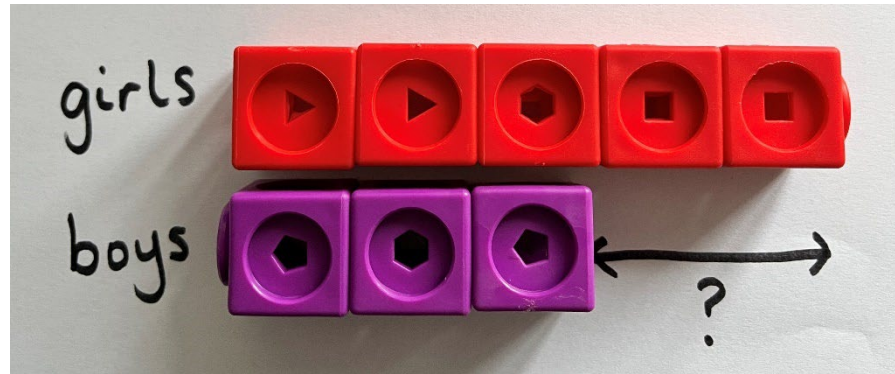
Sally buys four fifths of the shop's apples. If the shop had 30 apples, how many apples did she buy?



James had some football cards. He gave two fifths away. He now has 24 cards. How many did he have to start with?



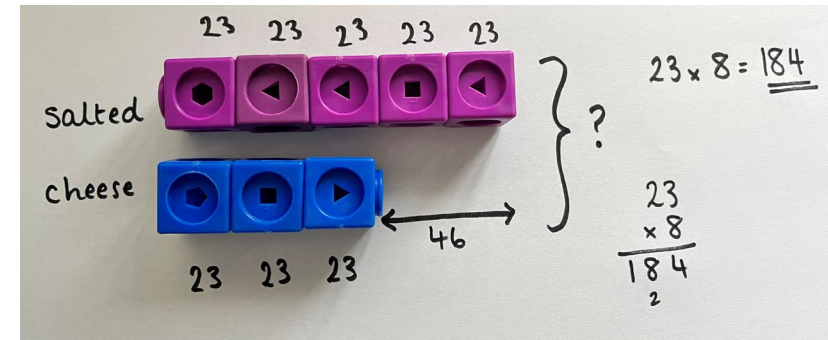
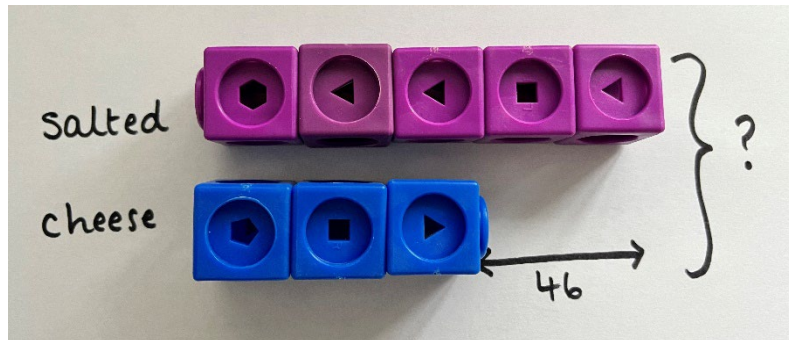
At the school disco, there are 5 girls to every 3 boys. If there are 136 children at the disco. How many more girls than boys are there?



## Ratio and proportion

- Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

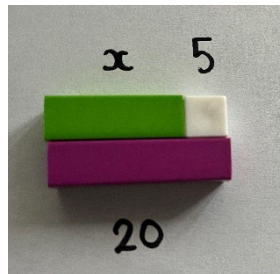
In a survey, the ratio of the number of people who preferred 'ready-salted' to 'cheese and onion' crisps was 5:3. Forty-six more people preferred ready-salted. How many people took part in the survey?



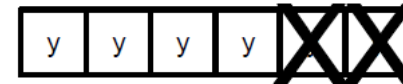
## Algebra

- Express missing number problems algebraically

$$x + 5 = 20$$



$$6y - 2y = 4y$$



What is  $2n + 9$  when  $n = 22$ ?

