Spring
Scheme of learning

Year 2

#MathsEveryoneCan

Spring Block 1

Money

White Rose MATHS

Small steps

Step 1	Count money – pence
Step 2	Count money – pounds (notes and coins)
Step 3	Count money – pounds and pence
Step 4	Choose notes and coins
Step 5	Make the same amount
Step 6	Compare amounts of money
Step 7	Calculate with money
Step 8	Make a pound

Small steps

Step 9	Find change
Step 10	Two-step problems

Count money – pence

Notes and guidance

In this small step, children count money in pence. They should be able to recognise coins based on their real-life experience, as well as earlier learning in Year 1, but may need a quick recap on each coin and its value. They may need to be formally introduced to the term "worth" and its meaning in this context. Although children may have seen values written as, for example, "5p" meaning 5 pence, some might need to be explicitly introduced to this notation.

Children use their knowledge from place value and addition and subtraction to find the total value of a set of coins, with all answers being less than £1. They should be able to count up in 1ps, 2ps, 5ps and 10ps, and use related facts to count up in 20ps, as well as finding the total of a mixed set of coins.

Children do not need to convert between pounds and pence, so while they must be able to recognise a 50p coin, they do not need to count up in 50ps.

Things to look out for

- Children may think that a bigger coin is greater in value, for example 2p is worth more than 5p.
- Children may simply count the number of coins, rather than consider their value.

Key questions

- What is this coin worth?
- Which coin is worth more?
- How many _____ are there?
- What is the total value of _____ 1p/2p/5p/10p coins?
- How does counting in 2s help you to count in 20s?
- How much money is there altogether?
- Which coins did you count first?

Possible sentence stems

- There are _____ _____ p coins.

  The total value of the coins is _____ p.
- There are _____ _____ p coins and _____ _____ p coins.

  The total value of the coins is _____ p.

National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Count money – pence

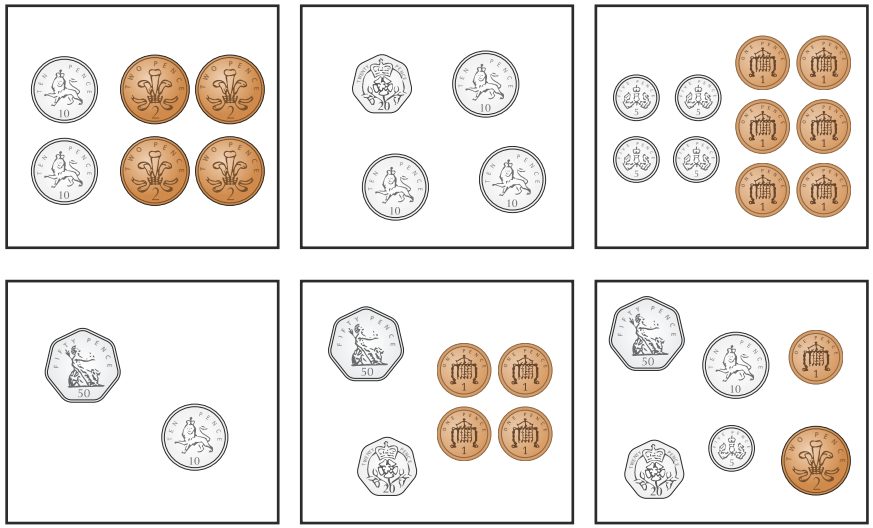
Key learning

- Count the money.
  - 
  - 
  - 
  - 
  - 

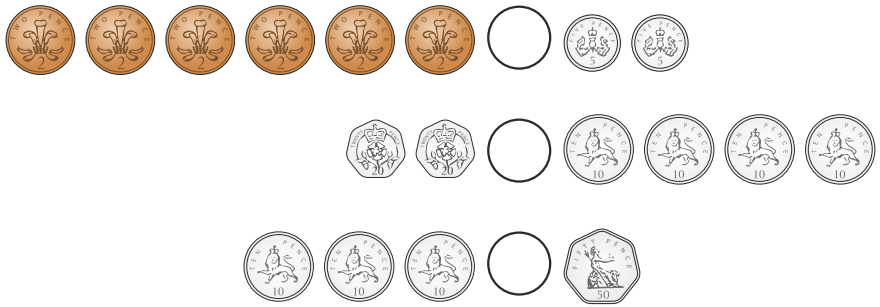
- Complete the sentences to count the money.

  - There are _____ 10p coins.
    The total value is _____ p.
  - There are _____ 1p coins.
    The total value is _____ p.
  - There is _____ p altogether.

- How much money is in each box?



- Write <, > or = to compare the money.



Count money – pence

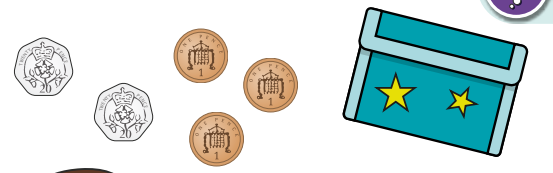
Reasoning and problem solving

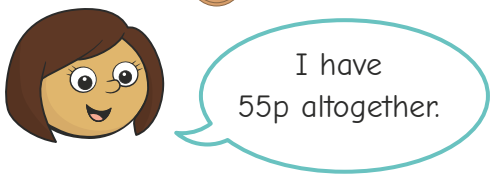
Give children a selection of 1p, 2p, 5p, 10p and 20p coins and challenge them to make 20p in each denomination.

Ask them how many coins they use each time. What do they notice?

various answers

Kim has some coins.



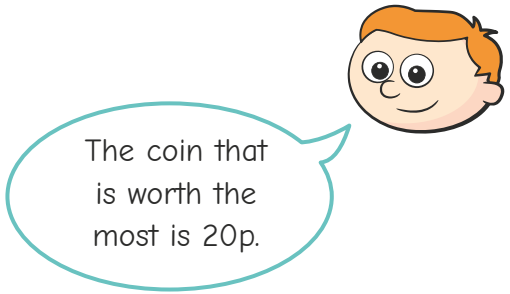


What coins could be in the purse?

Talk about it with a partner.

multiple possible answers, e.g.
1 × 10p and 2 × 1p

Ron has three different coins.



How much money could Ron have?

multiple possible answers, e.g.
23p, 26p, 35p

Get children to work in pairs counting different sets of coins.

Ask them to describe how they count them.

Encourage children to count coins of the highest value first.

Answers will vary, depending on the sets of coins.

Count money – pounds (notes and coins)

Notes and guidance

In this small step, children count money in pounds. They should be able to recognise both notes and coins based on their real-life experience, as well as earlier learning in Year 1, but may need a quick recap on each note or coin and its value.

Although children may have seen values written as, for example, "£5", meaning 5 pounds, some might need to be explicitly introduced to this notation. Children use their knowledge from place value and addition and subtraction to find the total value of a set of notes and coins. All answers will be less than £100. They should be able to count up in £1s, £2s, £5s and £10s, and use related facts to count up in £20s, as well as being able to find the total of mixed sets of notes and coins.

Children do not need to count beyond 100, so while they must be able to recognise a £50 note and know that two £50 notes are £100, they do not need to go beyond this.

Things to look out for

- Children may think that coins are always pence.
- Children may forget to write "£" with their answer.
- Children may simply count the number of notes/coins, rather than consider their value.

Key questions

- What is this coin/note worth?
- Which coin/note is worth more?
- How many _____ are there?
- What is the total value of _____ £1/£2 coins?
- What is the total value of _____ £5/£10/£20/£50 notes?
- How much money is there altogether?
- Which did you count first?

Possible sentence stems

- There are _____ _____ coins/notes.

  The total value is £_____
- There are _____ _____ coins/notes and _____ _____ coins/notes.

  The total value is £_____

National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Count money – pounds (notes and coins)

Key learning

- Count the money.
  - 
  - 
  - 
  - 
  - 

- Complete the sentences to count the money.

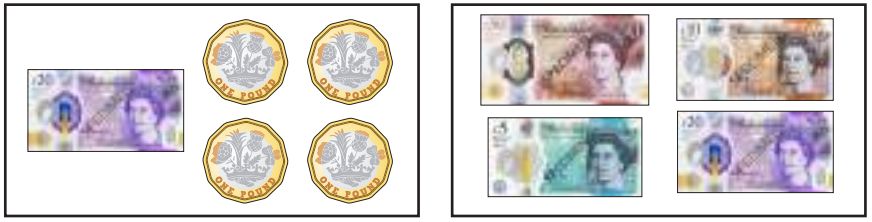
  - There is _____ £50 note.
    The total value is £_____
  - There are _____ £1 coins.
    The total value is £_____
  - There is £_____ altogether.

- Complete the bar models.

- Match the money to the correct total.

£25 £60 £10

- How much money is in each box?



Count money – pounds (notes and coins)

Reasoning and problem solving

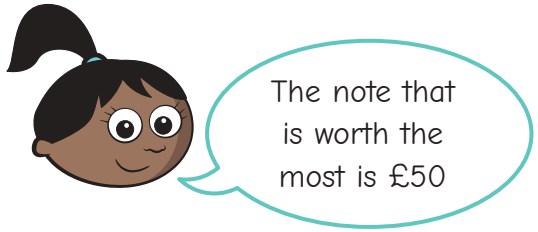
Give children a selection of £1 and £2 coins and £5, £10 and £20 notes.

Challenge them to make £20 in each denomination.

Ask them how many coins or notes they use each time. How many other ways can they make £20?

multiple possible answers

Sam has three different notes.



How much money could Sam have?

£65, £75 or £80

Max has this money.

Is Tiny correct?

Explain your answer.

Mo has the same note and coins as Max, and one extra note.

How much money could Mo have?

No

£21, £26, £36 or £66

Count money – pounds and pence

Notes and guidance

In this small step, children combine their learning from the previous two steps to count money in both pounds and pence. Decimal notation is not introduced in Key Stage 1, so children will represent amounts using "and", for example £5 and 30p, rather than £5.30

As the notation of "£" and "p" may have been new to children in the previous steps, they may need reminding of these to ensure that they are using them correctly.

Children will not count across £1, so the pence value will always be less than 100p. Also, as children do not go beyond 100 in Year 2, all the pound values will be less than £100

Encourage children to consider and count pounds and pence separately before combining them. It is important that they can interpret the values they have written down, for example reading "£5 and 30p" as "5 pounds and 30 pence".

Key questions

- What is this coin/note worth?
- Which coin/note is worth more?
- What is the total value of _____ £ _____ notes/coins?
- What is the total value of _____ _____ p coins?
- How much money is there altogether?

Possible sentence stems

- There are _____ £ _____ coins/notes.

  The total value of the coins/notes is £ _____
- There are _____ _____ p coins.

  The total value of the coins is _____ p.
- There is £ _____ and _____ p altogether.

Things to look out for

- Children may mix up pounds and pence.
- Children may simply count the number of notes/coins, rather than consider their value.

National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Count money – pounds and pence

Key learning

- Complete the sentences to count the money.

  - There are _____ £10 notes.

    The total value is £_____
  - There are _____ 2p coins.

    The total value is _____ p.
  - There is £_____ and _____ p altogether.

- How much money is there?

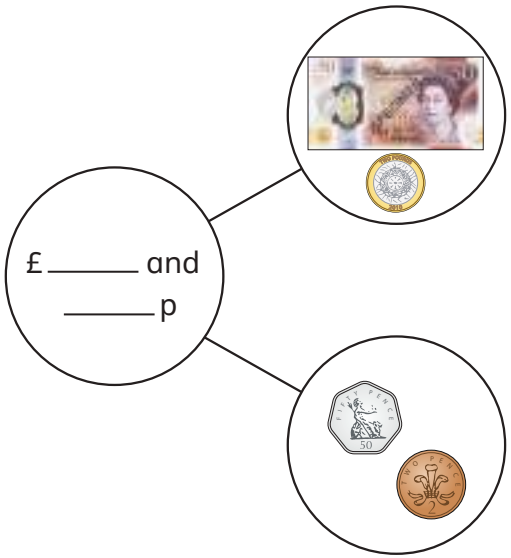
- How much money is there?

- Fill in the missing numbers to make the statements correct.
  - £10 + £5 + 50p = £_____ and _____ p
  - £20 + £2 + 10p + 10p + 2p = £_____ and _____ p
  - £5 + £_____ + 50p + 20p + 20p + 1p = £10 and _____ p

Count money – pounds and pence

Reasoning and problem solving

Complete the part-whole model.



What is the same and what is different about the parts?

£52 and 52p

Tiny has this money.

Is Tiny correct?

Explain your answer.

No

Choose notes and coins

Notes and guidance

In this small step, children build on the learning from earlier in the block, choosing notes and coins to make a given amount. Children select notes and coins from a bigger set, reinforcing their learning on counting money as a method of checking their answers.

Initially, children focus on selecting pounds or selecting pence, explicitly focusing on notes and coins separately, before going on to choose both pounds and pence from a set of notes and coins. Children do not need to choose an amount where they need to combine pence to make a pound. Children should be stretched to consider whether there is more than one way of selecting the given amount from the money that they have. Alternatively, they could be given limitations, for example "Choose three coins that have a total of 25p."

Things to look out for

- Children may confuse pounds and pence.
- Children may confuse the notation for pounds and pence.
- Children may select the number of coins, for example choosing any three coins for 3p, rather than considering value.

Key questions

- How much money do you need?

  How much money have you got?

  How much more money do you need?
- How do you know you have made _____?
- Can you find another way to make the same amount?
- Does it matter if you count the pounds or pence first?
- Does swapping _____ for _____ change the total?

Possible sentence stems

- There are _____ £ _____ notes/coins.

  There are _____ _____ p coins.

  There is £ _____ and _____ p in total.

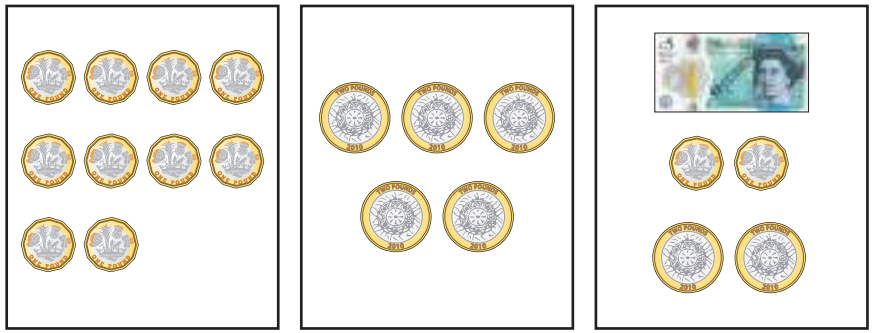
National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Choose notes and coins

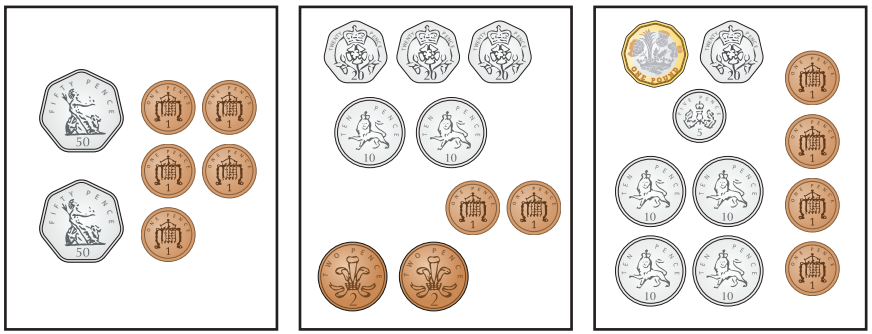
Key learning

- Choose £6 from each box.



Compare answers with a partner.

- Choose 53p from each box.



Compare answers with a partner.

- Choose £2 and 56p.

Can you choose different coins?

- Choose £45 and 18p.

Can you choose the same amount a different way?

- Draw money to show each amount.

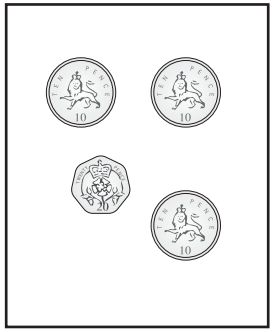
£6	£6 and 75p	£21 and 32p
75p	£5 and 53p	£13 and 40p

Choose notes and coins

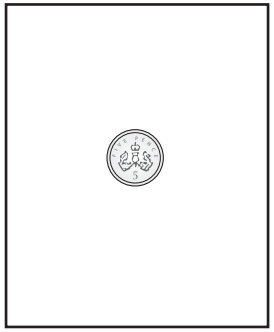
Reasoning and problem solving

Which box does **not** show 50p?

A



B



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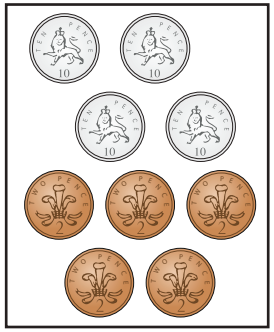
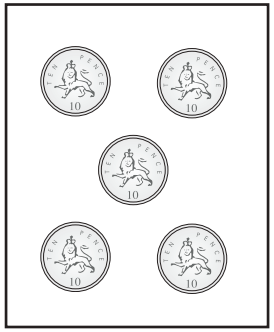


D



How do you know?

B

Use the money to fill the purses.

You can use each note or coin only once.

multiple possible answers, e.g.

£10 and 15p:
£5, 2 × £2, £1, 10p, 5p

£5 and 51p:
£2, 3 × £1, 2 × 20p, 10p, 1p

Make the same amount

Notes and guidance

In this small step, children explore different ways of making the same amount. They may have had some experience of this earlier if there was more than one way to choose a given amount from a set of coins, but here they focus on it explicitly. As in the previous step, children are not required to count in pence to make a pound, as this will be looked at later.

This step follows a similar structure to the previous one, where children are first exposed to only pounds or only pence, before looking at examples that include both pounds and pence. When looking at such examples, it is useful to model a strategic approach where first the pounds are made and then the pence, to avoid children confusing the two.

Children could start by making the amount in one way, before swapping notes/coins for other notes/coins that make the same value. For example, they could swap a 20p coin for two 10p coins to make the same amount.

Things to look out for

- Children may confuse pounds and pence.
- When swapping coins for others with the same value, children may not remove the coin they are swapping, so they no longer have the correct amount.

Key questions

- Can you make the same amount a different way?
- How do you know the amount is the same?
- What can you swap a £20 note for to keep the amount the same?
- Can you swap any notes/coins to make the same amount?
- What is the fewest number of coins you can use to make _____?

Possible sentence stems

- One £_____ note is worth the same as two £_____ notes.
- One £_____ coin is worth the same as two £_____ coins.
- One _____ is worth the same as _____
- I know the amount is the same because ...

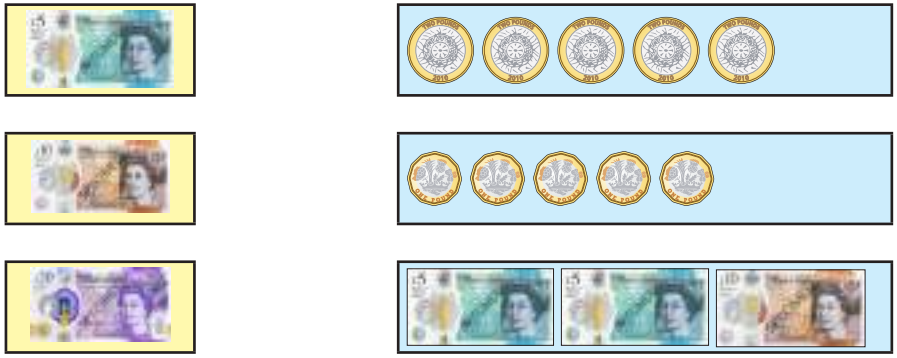
National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Make the same amount

Key learning

- Match the amounts that are the same.



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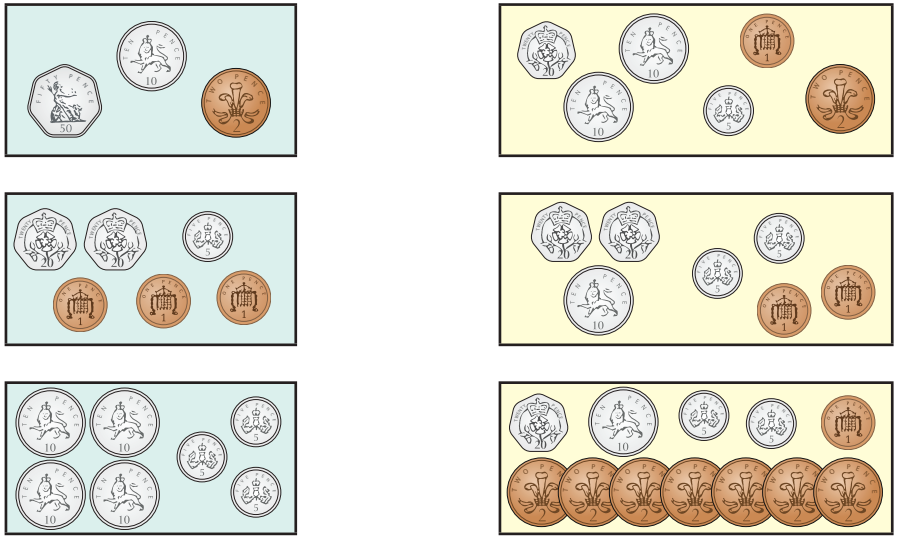
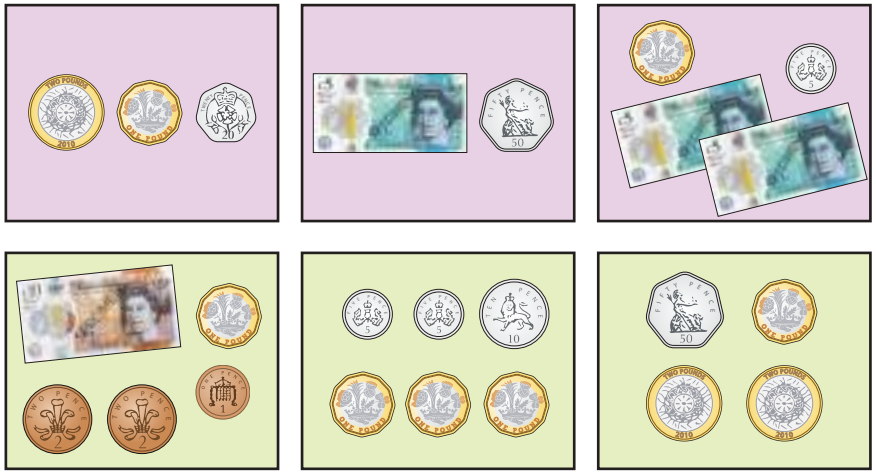
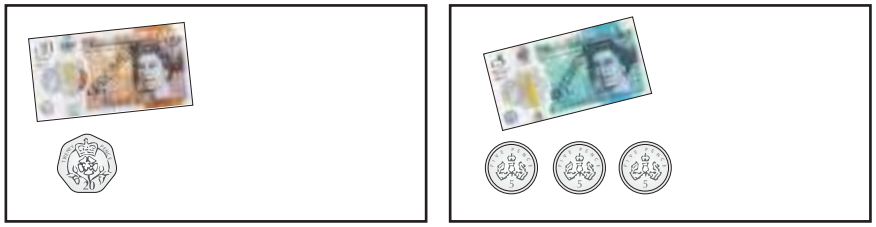


- Match the amounts that are the same.



- Draw money so that each box has £12 and 35p.



- How many ways can you make £4 and 26p?

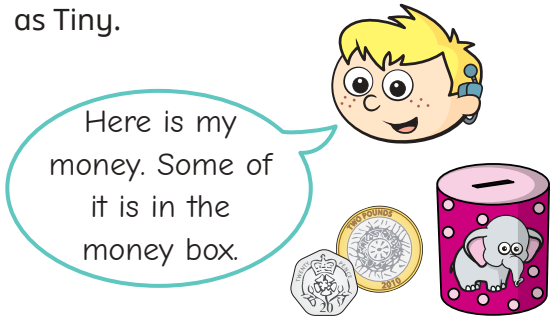
  Compare answers with a partner.

Make the same amount

Reasoning and problem solving

Tiny has this money.

Max has the same amount of money as Tiny.

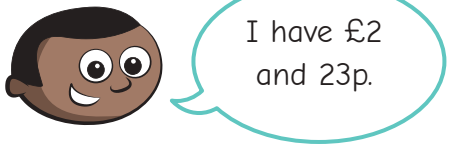


What coins could Max have in the money box?

Compare answers with a partner.

multiple possible answers, e.g.
50p, 20p, 2p, 2p, 2p

Mo has some money.



What is the fewest number of coins that Mo could have?

How do you know?

four

Miss Rose has £39 and 21p.

She has four notes and five coins.

What notes and coins has Miss Rose got?

Is there more than one answer?

multiple possible answers, e.g.
3 × £5, 1 × £20,
2 × £2, 2 × 10p
and 1 × 1p

Compare amounts of money

Notes and guidance

In this small step, children compare amounts of money using the language of "greater than", "less than", "most" and "least", together with the inequality symbols. As inequality symbols are often a sticking point for children, they may need a reminder of the meaning of each symbol before continuing with the step.

Children compare amounts of money that are made up of both pounds and pence, but they only need to focus on one of these, as the other will be the same. For example, they may compare £3 and 20p with £3 and 60p, where £3 is the constant, or compare £4 and 50p with £7 and 50p, where 50p is the constant. They should recognise that since one part is the same, they can just compare the other.

It is important that children know that £1 is worth more than 1p, so if they compare £3 with 3p, then they know that £3 is worth more.

Things to look out for

- Children may only compare the numerical values and not consider the units.
- Children may only consider the quantity of notes/coins rather than their value.

Key questions

- Which is worth more, £1 or 1p? How do you know?
- How much money is there?
- If the number of pounds is the same, what can you compare?
- If the number of pence is the same, what can you compare?
- Which amount is the greatest/smallest? How do you know?
- Who has the least/most money? How do you know?

Possible sentence stems

- £3 and _____ p is greater than £3 and _____ p because ...
- £ _____ and 20p is less than £ _____ and 20p because ...
- I know that £ _____ and _____ p is greater/less than £ _____ and _____ p because ...

National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Compare amounts of money

Key learning

- Which note is worth the most?

How do you know?

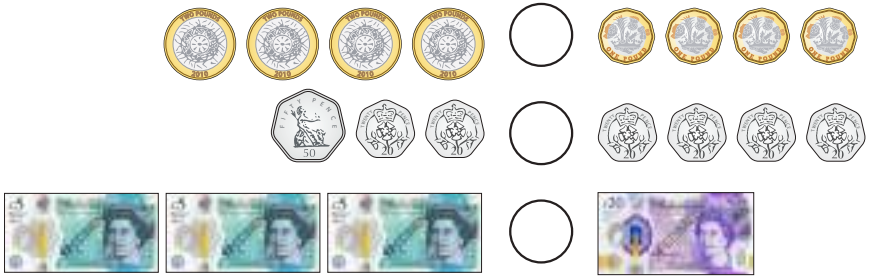
- Which coin is worth the least?

How do you know?

- Which is the greatest amount of money?

How do you know?

- Write <, > or = to compare the amounts.



- Write <, > or = to compare the amounts.

£3 and 56p ◯ £3 and 72p

£5 and 29p ◯ £1 and 29p

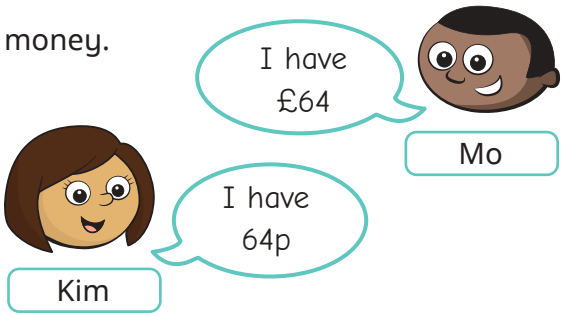
£21 and 50p ◯ £21 and 7p

- Mo and Kim have some money.

Who has more money?

Who has less money?

How do you know?



Compare amounts of money

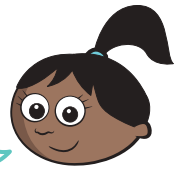
Reasoning and problem solving

Ron and Sam each have three coins.

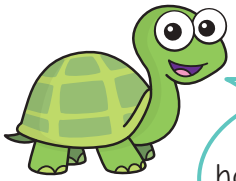
One of my coins is a 50p coin.

Ron

One of my coins is a 10p coin



Sam



Ron must have more money than Sam.

Tiny

Do you agree with Tiny?

Talk about it with a partner.

No

Jo, Max and Kim each have some money.

I have £4 and 52p.

Jo

I have £4 and 81p.

Max

I have £2 and 52p.

Kim

Who has the most money?

Who has the least money?

How do you know?

Dan has more money than Jo, but less money than Max.

How much money could Dan have?

Max

Kim

any amount between £4 and 52p and £4 and 81p

Calculate with money

Notes and guidance

In this small step, children combine their learning from an earlier block on addition and subtraction with their new learning on money to perform calculations involving money. They need to be able to find the total cost or find the difference in prices.

As children have not converted between pounds and pence, none of the calculations will require an exchange from pence to pounds.

When finding the total, children should be encouraged to consider different methods such as counting on, partitioning and regrouping. When finding the difference, children should explore both counting on and counting back. They can compare and contrast methods to decide which one is more efficient.

Things to look out for

- Children may add all the numbers rather than adding the pounds and pence separately, for example thinking that the total of £3 and 10p and £2 and 10p is £25 or 25p, because 3 + 10 + 2 + 10 = 25
- When finding the difference, the language in the question may confuse children. For example, when asked to find how much more somebody has, they may think they need to add because of the word "more".

Key questions

- What does "total" mean?
- What does "difference" mean?
- How many pounds/pence are there altogether?
- How many more pounds/pence are there?
- How much more money does _____ need?

Possible sentence stems

- £ _____ plus £ _____ is equal to £ _____

  _____ p plus _____ p is equal to _____ p.

  £ _____ plus _____ p is equal to £ _____ and _____ p.
- The difference between £ _____ and £ _____ is £ _____

  The difference between _____ p and _____ p is _____ p.

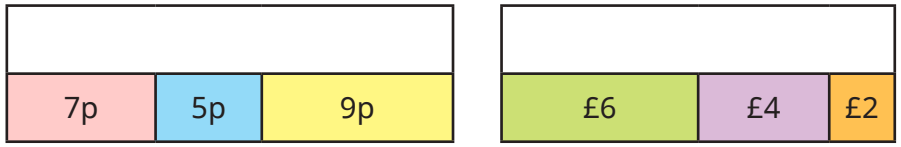
National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

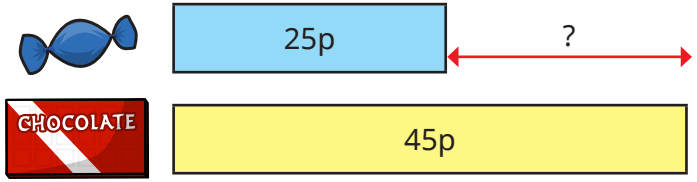
Calculate with money

Key learning

- Complete the bar models.

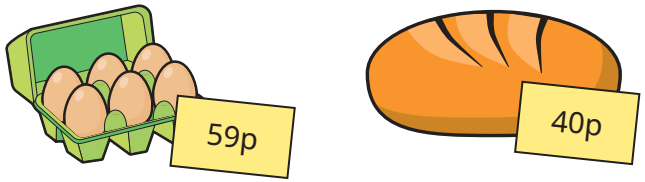


- How much more does the chocolate bar cost than the sweet?



- How much more money does Kay have than Ann?

- Mr Lee buys these two items.

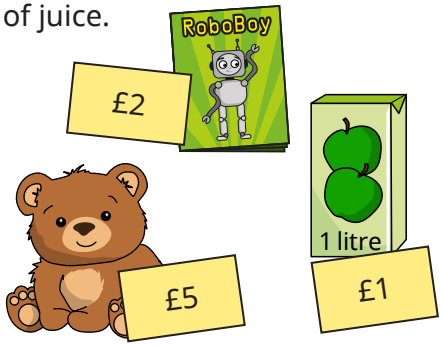


How much does he spend?

- Ben buys a magazine and a carton of juice.
  - How much does Ben spend?

Fay buys a teddy and a magazine.

  - How much does Fay spend?
  - How much more does a teddy cost than a magazine?



- Jo has £2 and 15p.

Tom has £2 and 40p.

  - How much money do they have altogether?
  - How much more money does Tom have than Jo?

Calculate with money

Reasoning and problem solving

Here is a price list.

Item	Price
ruler	18p
pencil	32p
crayon	27p
pen	45p
glue	36p

Sam buys two items for 50p.

What two items does she buy?

Mo buys two of the same item for 90p.

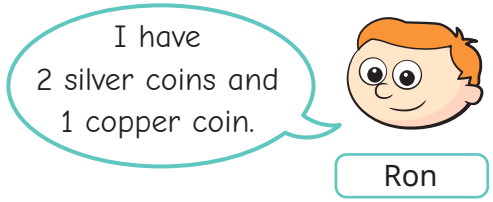
What item did he buy two of?

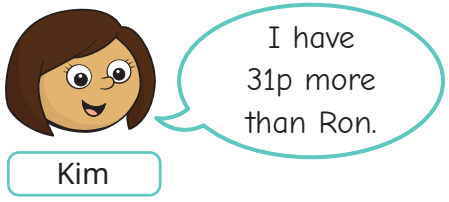
How much could Tiny have spent?

ruler and pencil

pen

Kim and Ron have some money.





What coins does Ron have?

20p, 5p and 1p

Make a pound

Notes and guidance

In this small step, children explore for the first time the equivalence of £1 and 100p.

It is essential for children to understand that £1 is equal to 100p or that £1 is made up of 100 pence. Using this knowledge, they should be able to make £1 in different ways and using a variety of coins. This will support them later in the block when they work out change, as being able to make £1 in different ways will mean that children will find it easier to find change from £1

Children use their knowledge of bonds to 100 from earlier learning to support them, both working with tens and working with tens and ones. When working with just tens, children should know that, for example, 30 + 70 = 100, but should then realise that since there is not a 30p or 70p coin, this on its own cannot be used to make a pound.

As children do not go beyond 100, there is no need for them to know related facts for other whole pounds.

Things to look out for

- Children may focus on using only multiples of the same coin to make £1, rather than combining different coins.
- Children may not use combinations of 1p or 2p coins and focus only on coins with a higher value.

Key questions

- How many pence are there in £1?
- Can you make £1 using _____ p coins?
- Can you make £1 using different coins?
- How do you know you have £1?
- How do bonds to 100 help you make £1?
- 70 + 30 = 100, so can you make £1 using a 70p coin and a 30p coin? How do you know?

Possible sentence stems

- One pound is equal to _____ pence.
- There are _____ _____ p coins in £1
- _____ + _____ = 100, so _____ p + _____ p = £1

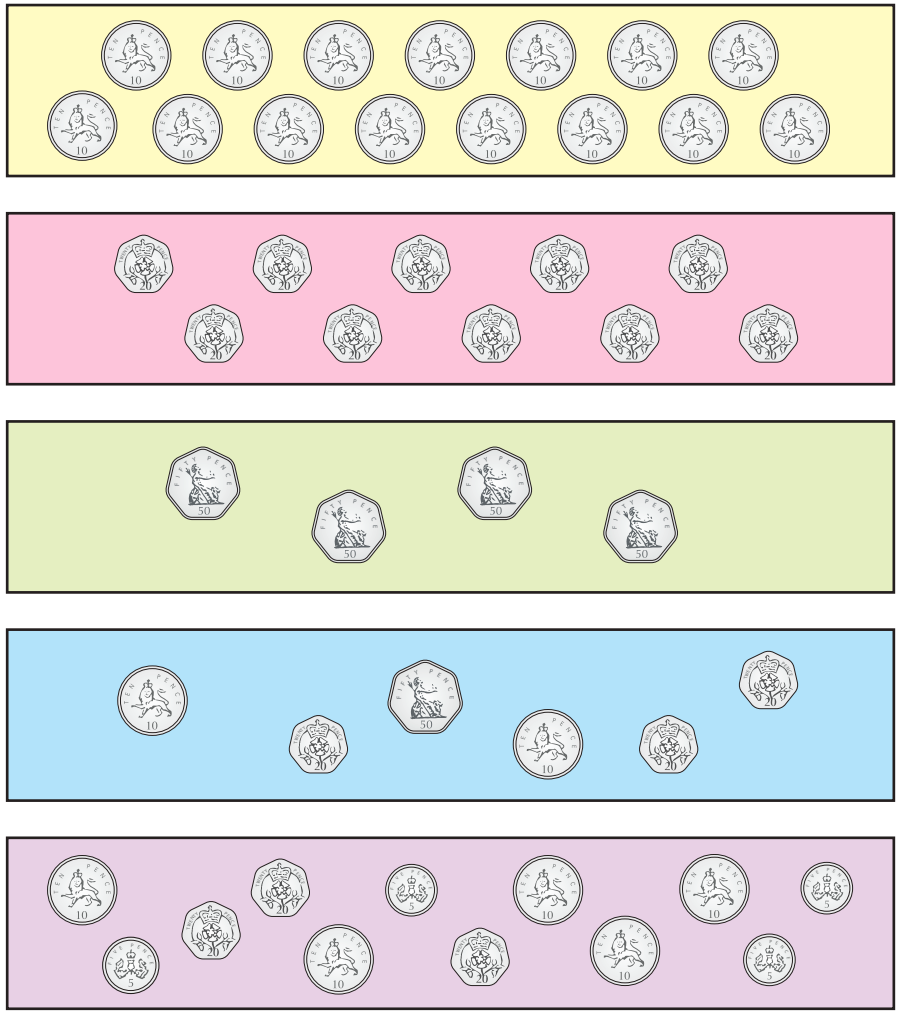
National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

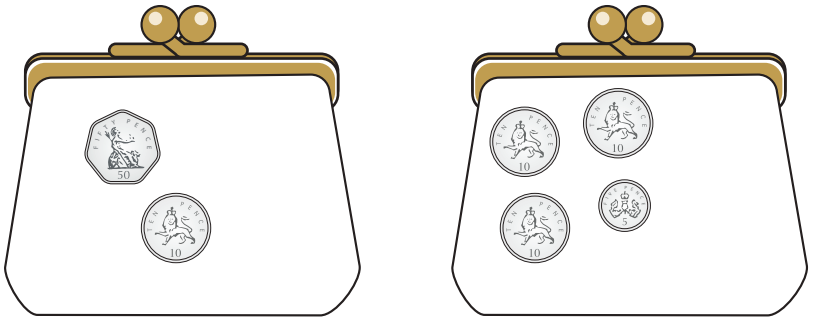
Make a pound

Key learning

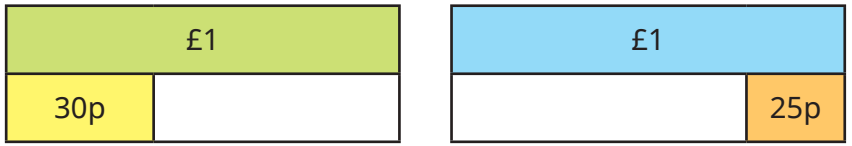
- For each set of money, choose coins to make £1



- Draw money so that each purse has £1



- Complete the bar models.



- Complete the additions.
  - 50p + _____ p = £1
  - 10p + _____ p = £1
  - _____ p + 55p = £1
  - £1 = _____ p + 28p

Make a pound

Reasoning and problem solving

Ask children to make £1 using the same value of coin.

- only 50p coins
- only 20p coins
- only 10p coins
- only 5p coins
- only 2p coins
- only 1p coins

Ask them what patterns they can see.

When children have established the relationship between coin value and number of coins, ask them to find the maximum and minimum number of coins they can use to make £1

Discuss what happens if they use different denominations rather than all the same.

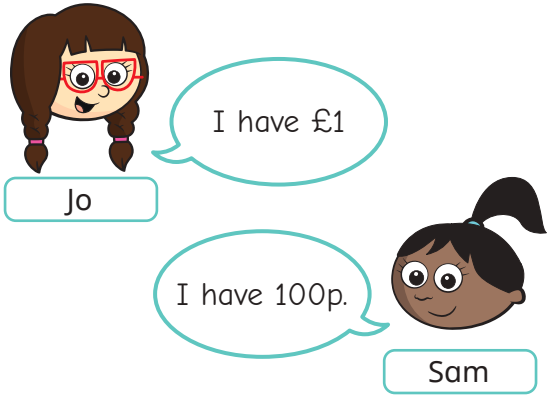
50p: 2; 20p: 5; 10p: 10; 5p: 20; 2p: 50; 1p: 100

The greater the coin value, the fewer coins are needed.

100 1p coins

1 £1 coin

Jo and Sam have some money.



Who has more money?

How do you know?

They have the same amount.

Dan has 20 of the same coin.

He has £1 altogether.

What coin does Dan have 20 of?

How do you know?

5p

Find change

Notes and guidance

The focus of this small step is on finding change from £1. Children explore a variety of different methods of calculating change. They could start by making £1 using different coins, building on the learning from the previous step, then remove the coins that are spent and count what is left. They could then go on to use more abstract methods, such as counting back and counting on, using a number line. When children are confident in calculating change from £1, they can explore finding change from other whole pounds.

The examples used should be as realistic as possible in terms of the amounts involved, for example finding change from £5 (a note that exists) versus finding change from £4 (which has no specific coin or note).

Things to look out for

- Children may not understand the meaning of the word "change" in this context, so this might need explaining.
- Children may give their answer in pounds rather than pence, because the amount they are finding change from is given in pounds.
- Children may struggle when their calculations involve an exchange.

Key questions

- How many pence are there in one pound?
- How else can you make £1?
- How much money does _____ have?

  How much money does _____ spend?

  How much change will _____ get?
- If you have £_____ and spend _____p, how much change will you get?

Possible sentence stems

- One pound is equal to _____ pence.
- 100 – _____ = _____, so £1 – _____p = _____p

  The change from £_____ is _____p.

National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Find change

Key learning

- Kay has £10

  She buys a book for £4

  Complete the bar model.

£10	
£4	

  How much change does Kay get?

- Ben has this money.

  - How much money does Ben have?

  He spends 30p on some sweets.

  - How much does he have left?

- Ann has this money.

  She spends 65p.

  How much does she have left?

- Tom has £1 and spends 40p.

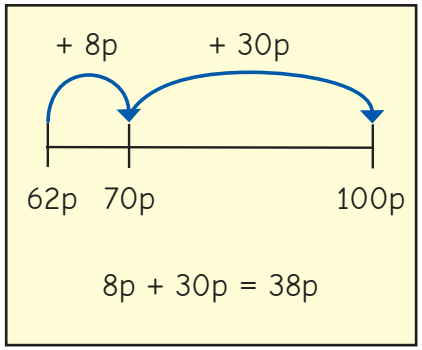
  How much change does Tom get?

- Fay and Max each have a £1 coin.

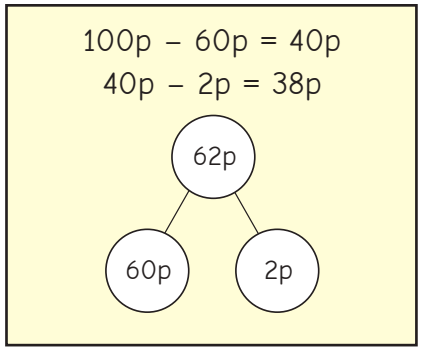
  They want to work out how much change they will get if they spend 62p.

  Here are their methods.

Fay



Max



Use one of the methods to work out the change from £1 when you spend each amount.

- 61p
- 97p
- 24p
- 13p
- 78p
- 36p

Find change

Reasoning and problem solving

Kim pays for a chocolate bar with a £1 coin.

Here is her change.

How much was the chocolate bar?

How do you know?

69p

Mo pays in a shop with a £1 coin.

He gets one coin as change.

How much money could Mo have spent?

Talk about it with a partner.

99p, 98p, 95p, 90p, 80p or 50p

Ron buys two of these items.

He gets 35p change.

Which items does Ron buy?

pencil and pen

Max buys a chew bar for 9p.

He pays with a £10 note.

Do you agree with Tiny?

Explain your answer.

No

Two-step problems

Notes and guidance

In this small step, children bring together all their learning from this block to complete two-step problems involving money. This step requires children to find the total, find the difference and calculate change, and combinations of all three within the same question.

Children must work out what they need to do first in the context of the question and may need support with this initially.

Finding the total can now include pairs of values that sum to a whole pound as children have explored this in a previous step. They continue to only calculate change from whole pounds.

The use of play money, number lines and part-whole models can support children in performing calculations, and bar models can be a useful way of representing a question to help children understand what they need to do.

Things to look out for

- Children may struggle with the maths because they are overwhelmed by the context of a question.
- Children may not understand what they need to do first.
- Children may perform calculations in the incorrect order.

Key questions

- How much money is there in total?
- How much money is spent?
- What is the total cost of _____ and _____?
- How much more does _____ cost than _____?
- What is the difference in price?

Possible sentence stems

- The total cost of _____ and _____ is £ _____ and _____ p.
- If I pay with a _____ note/coin, I will get _____ change.
- _____ costs _____ more/less than _____
- The difference in price between _____ and _____ is _____

National Curriculum links

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Two-step problems

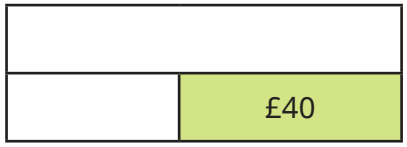
Key learning

- Kay has £33 in the bank.

  She is given £40 more.

  - How much money does Kay have now?

  Complete the bar model and number sentence.



_____ + _____ = _____

  She buys a top for £25

  - How much money does she have now?

  Complete the bar model and number sentence.

_____ – _____ = _____

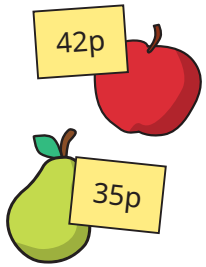
- An apple costs 42p. A pear costs 35p.

  - What is the total cost of an apple and a pear?

  Dan buys an apple and a pear.

  He pays with a £1 coin.

  - How much change does he get?



- A coat costs £18

  A T-shirt costs £5 less than a coat.

  - How much does a T-shirt cost?

  Ben buys a coat and a T-shirt.

  - How much does Ben spend?

  He pays with a £50 note.

  - How much change does he get?

- A scarf is £12 and a bag is £25

  Sam buys one of each.

  She pays with a £50 note.

  How much change does she get?

- A book costs £3 and 40p.

  A magazine costs £1 and 30p less than the book.

  What is the total cost of a book and a magazine?

Two-step problems

Reasoning and problem solving

Jo buys two items.

She pays with three £20 notes.

Which items did Jo buy?

How do you know?

jumper and shorts

A cinema ticket costs £7 and 35p.

A cinema ticket costs £4 and 10p more than a tub of popcorn.

Explain the mistake that Tiny has made.

£4 and 40p

Max buys a cinema ticket and a tub of popcorn.

He pays with this money.

How much change does he get?

Spring Block 2

Multiplication and division

White Rose MATHS

Small steps

Step 1	Recognise equal groups
Step 2	Make equal groups
Step 3	Add equal groups
Step 4	Introduce the multiplication symbol
Step 5	Multiplication sentences
Step 6	Use arrays
Step 7	Make equal groups – grouping
Step 8	Make equal groups – sharing

Small steps

Step 9	The 2 times-table
Step 10	Divide by 2
Step 11	Doubling and halving
Step 12	Odd and even numbers
Step 13	The 10 times-table
Step 14	Divide by 10
Step 15	The 5 times-table
Step 16	Divide by 5

Small steps

Step 17	The 5 and 10 times-tables

Recognise equal groups

Notes and guidance

In this block, children make the connection between repeated addition and multiplication. In this small step, they start to make this connection by recognising equal groups.

It is important that children explore both equal and unequal groups, so that they are able to identify when groups are or are not equal and explain why. At this point, the addition and multiplication symbols are not used, but the language around this can still be used to support learning later in the block.

Sentence stems are used in this step to support children in identifying the groups, finding how many are in each group and developing language around repeated addition. Children use this knowledge over the next set of steps to complete multiplication calculations as repeated addition.

Things to look out for

- Children may not be able to spot equal and unequal groups.
- Children may try to find the total instead of finding the amount in each group.
- Children may not realise that two groups are equal if they do not look the same.

Key questions

- Are the groups equal or unequal? How do you know?
- How can you make the groups equal?
- How many groups are there?
- How many are in each group?
- What is the same and what is different about these two pictures?
- Do all equal groups look the same?

Possible sentence stems

- There are _____ equal groups.

  There are _____ in each group.

- There are _____ groups of _____

  There are _____ altogether.

- The groups are equal/unequal because ...

National Curriculum links

- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Recognise equal groups

Key learning

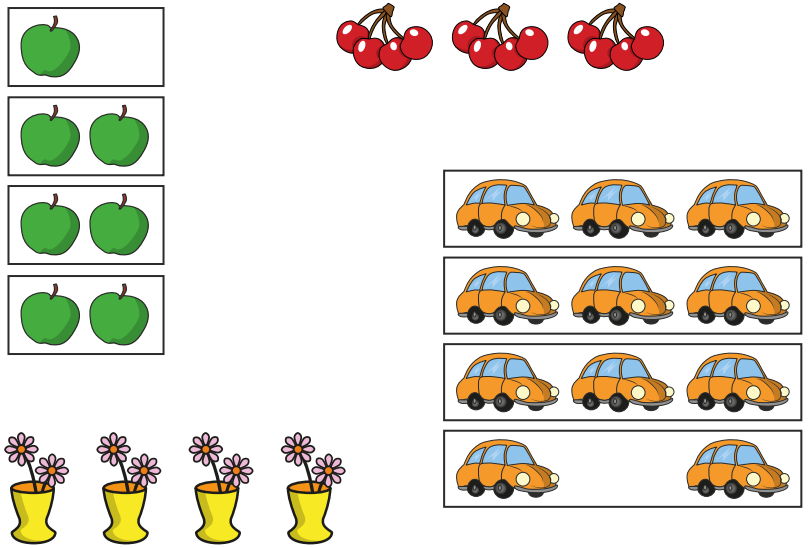
Take children outside and ask them to gather 10 objects.

Tell children to put their objects into groups.

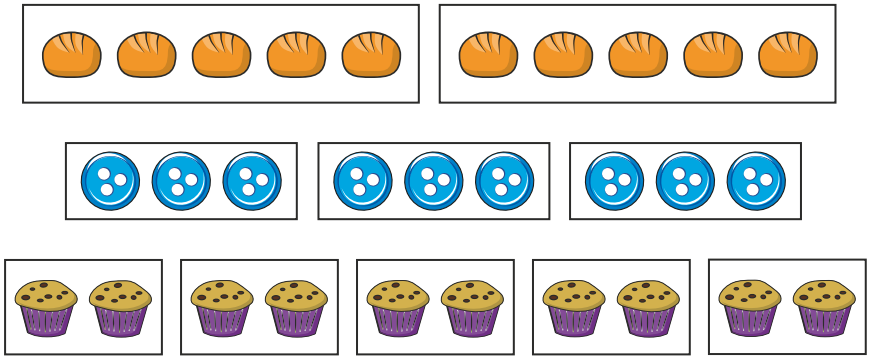
Discuss with them what they notice about their groups.

- Which pictures show equal groups?

  Which pictures show unequal groups?



- Complete the sentences for each set of pictures.



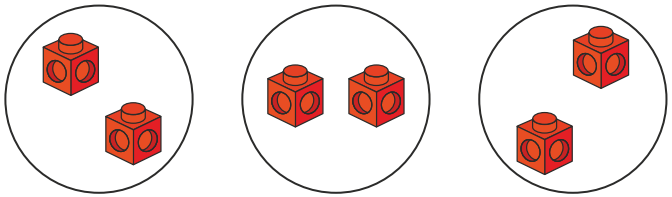
There are _____ equal groups.

There are _____ in each group.

There are _____ groups of _____

There are _____ altogether.

- Are the groups equal?

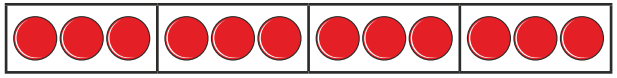


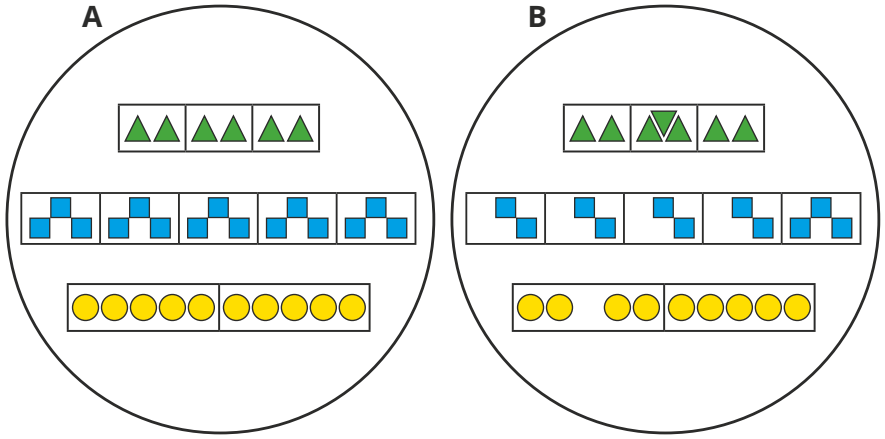
How do you know?

Recognise equal groups

Reasoning and problem solving

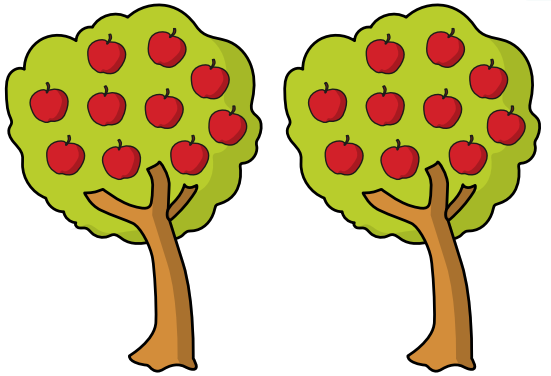
Which circle do the groups of counters belong to?

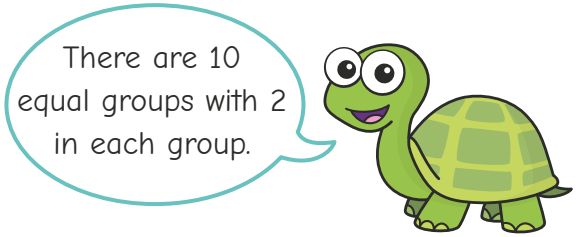




Explain your answer.

A





Do you agree with Tiny?

Explain your answer.

No

Make equal groups

Notes and guidance

In this small step, children move on from identifying equal groups to making equal groups with a given number of objects.

Children begin this step by identifying equal groups and matching equal groups to numerals and words. It is important that children can identify these groups accurately. They also represent equal groups by using concrete resources or drawing pictures, including completing a partly filled picture.

Children should be able to represent, for example, 4 groups of 3 as well as 3 groups of 4 accurately and know what is the same and what is different about the two forms. This could be a good opportunity to explore the idea of commutativity.

In the next step, children add equal groups as a repeated addition.

Things to look out for

- Children may not be able to recognise equal groups.
- When given a picture of incomplete groups, children may find it difficult to complete it to show a set number of equal groups.
- Children may represent a set of equal groups incorrectly, for example 2 groups of 4 instead of 4 groups of 2

Key questions

- Are the groups equal?
- How do you know if a group is equal or not equal to another group?
- How can you make these groups equal?
- How many equal groups can you put these counters into?
- Can you draw _____ groups of _____?
- How are 4 groups of 3 different from 3 groups of 4?

Possible sentence stems

- There are _____ equal groups with _____ in each group.
- There are _____ in each group.
  There are _____ equal groups.

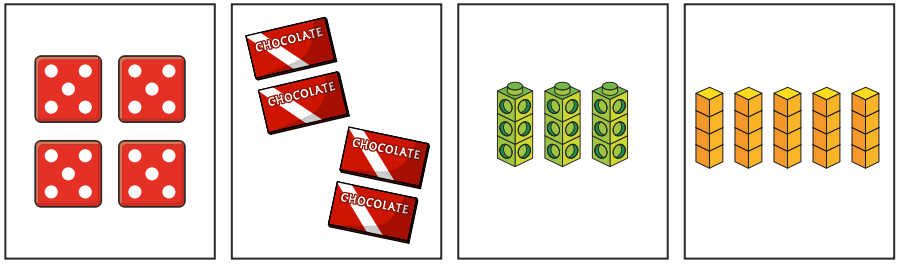
National Curriculum links

- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Make equal groups

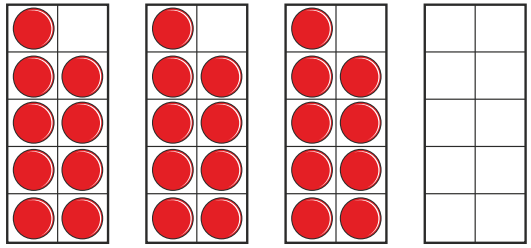
Key learning

- Match the pictures to the labels.



5 groups of 4	2 groups of 2	4 groups of 5	3 groups of 3

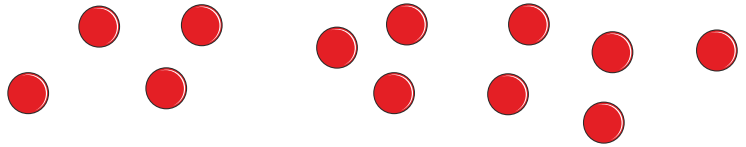
- Complete the ten frames to show equal groups.



Complete the sentence to describe the groups.

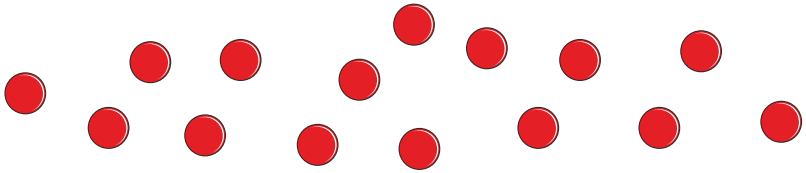
There are _____ equal groups with _____ in each group.

- Put 12 counters into different equal groups.



What do you notice?

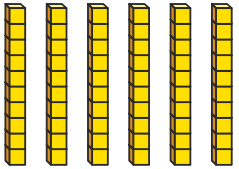
- Use 15 counters.



  - Make 3 groups of 5
  - Make 5 groups of 3

What is the same about the groups? What is different?

- Complete the sentences to describe the equal groups.



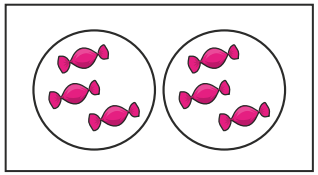
There are _____ equal groups of 10

There are _____ tens.

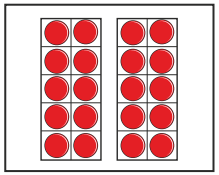
Make equal groups

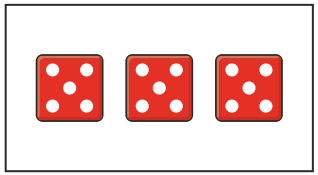
Reasoning and problem solving

Match the pictures and the labels.

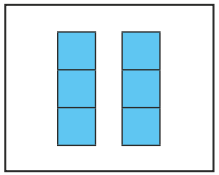


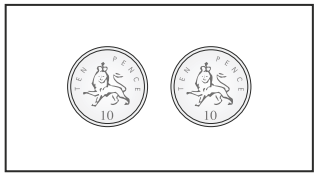
3 groups of 5



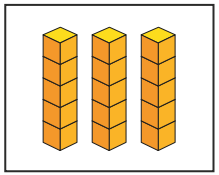


2 groups of 10





2 groups of 3

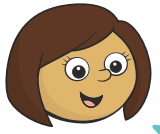


sweets – 2 groups of 3 – squares

dice – 3 groups of 5 – cubes

coins – 2 groups of 10 – ten frames

Kim and Max are making equal groups.



I am going to add more stars to make the groups equal.

Kim

What equal groups is Kim making?

I am going to move one star to make the groups equal.

Max

What equal groups is Max making?

3 groups of 4

3 groups of 3

Add equal groups

Notes and guidance

In this small step, children use their understanding of equal groups to find the total using repeated addition.

Sentence stems are used in this small step to scaffold the learning and to ensure that children use accurate language when writing number sentences. Children should be able to describe pictures using sentences and also create pictures from given sentences.

As children have already learnt to add three 1-digit numbers, they should be able to add up to three groups of any 1-digit number. If there are more than three groups, children can use their understanding of counting in 2s, 3s, 5s and 10s to find the total.

Children do not need to write multiplication number sentences, which are covered in the next step.

Things to look out for

- Children may not represent number sentences accurately when using manipulatives or drawing pictures.
- Children may not have efficient strategies for adding three 1-digit numbers.
- If they cannot count in 2s, 3s, 5s or 10s, children may not answer the calculations correctly.

Key questions

- How do you know the groups are equal?
- How many equal groups are there?
  How many are in each group?
- Can you write this as an addition sentence?
- Which number sentence matches the picture?

Possible sentence stems

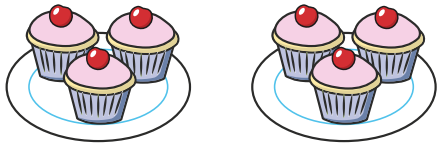
- There are 3 equal groups with _____ in each group.
  There are 3 groups of _____
  _____ + _____ + _____ = _____
- There are _____ equal groups with _____ in each group.
  There are _____ groups of _____
  There are _____ altogether.

National Curriculum links

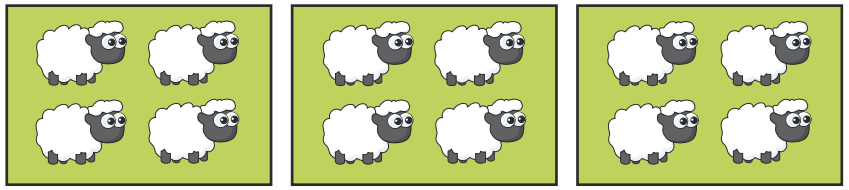
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Add equal groups

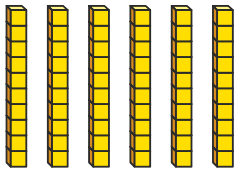
Key learning

- Complete the sentences to match the pictures.
  - 

    There are _____ equal groups with _____ in each group.

    _____ + _____ = 6
  - 

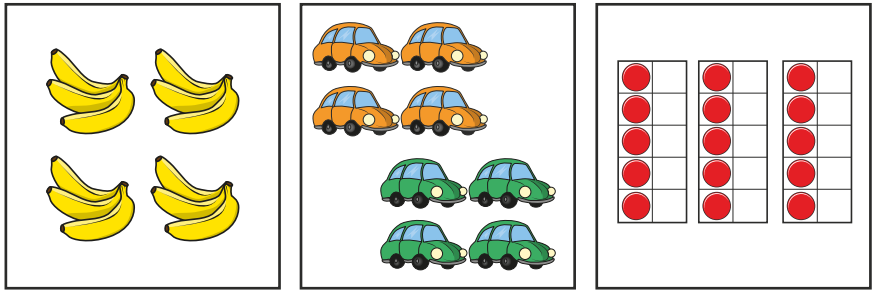
    There are _____ equal groups with _____ in each group.

    _____ + _____ + _____ = _____
  - 

    There are _____ equal groups with _____ in each group.

    _____ + _____ + _____ + _____ + _____ + _____ = _____

- Write a number sentence to match each picture.



- Draw a picture to match each number sentence.
  - 4 + 4 + 4 = 12
  - 2 + 2 + 2 + 2 + 2 + 2 = 12
  - 10 + 10 = 20
  - 5 + 5 + 5 + 5 = 20

- Complete the number sentences.
  - 5 + 5 + 5 = _____
  - 3 + 3 + 3 + 3 + 3 = _____

  What do you notice?

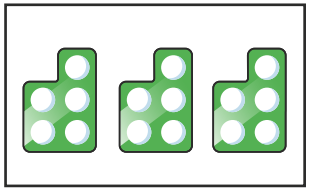
  Talk about it with a partner.

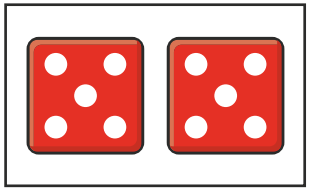
Add equal groups

Reasoning and problem solving

Which one does not belong?

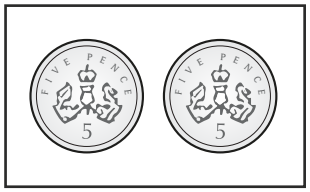
2 groups of 5





ten

5 + 5



What could you change to make it belong?

number shapes

take away one number shape

Tiny is adding equal groups.

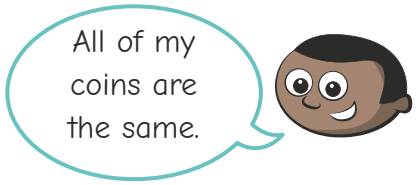
5 + 5 = 2 + 2 + 2 + 2 + 2

Do you agree with Tiny's addition?

Use cubes to help you explain.

Yes

Mo has 30p.



How many 10p coins could he have?

How many 5p coins could he have?

How many 1p coins could he have?

three 10p coins

six 5p coins

thirty 1p coins

Introduce the multiplication symbol

Notes and guidance

In this small step, children are introduced to the symbol for multiplication (×) and make the link between multiplication and repeated addition.

Children should already be secure in identifying equal groups and be able to represent this as an addition number sentence. They now write both a repeated addition and a multiplication number sentence. This step focuses on recognising multiplication number sentences that are equal to repeated additions, and correctly matching them to a context. Children are not required to find the total at this stage. Children could also be challenged to put a context to given multiplication and addition sentences.

Children may find that using the language "lots of" builds on previous learning, but they should also use other variations interchangeably, such as "times", "multiplied by" and so on.

Things to look out for

- Children may not make the link between repeated addition and multiplication.
- Children may not know what each number in the multiplication number sentence represents.
- Children may find it challenging to put a context to a multiplication number sentence.

Key questions

- Is repeated addition always the most efficient method? Why?
- What does the multiplication symbol look like?
- How else can you write this repeated addition number sentence?
- What is the same about repeated addition and multiplication? What is different?
- Which addition number sentence matches the multiplication?
- Can you think of a story to match the multiplication?

Possible sentence stems

- There are 3 equal groups with _____ in each group.

  _____ + _____ + _____ = _____

  _____ × _____ = _____

National Curriculum links

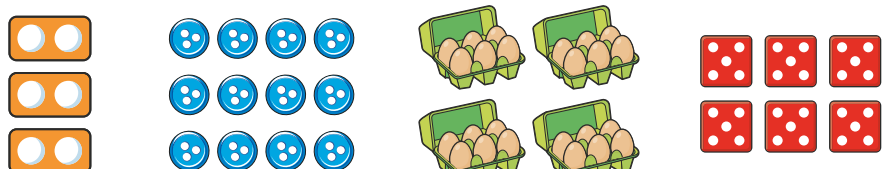
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Introduce the multiplication symbol

Key learning

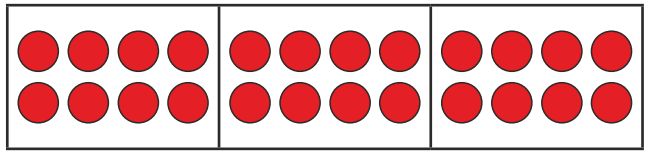
- Match the pictures to the labels.

  The first one has been done for you.



4 lots of 6 | 6 lots of 5 | 3 lots of 2 | 3 lots of 4

- Complete the sentences to describe the equal groups.

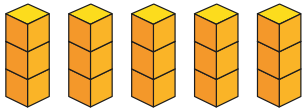


There are _____ equal groups with _____ in each group.

_____ + _____ + _____ = 24

_____ × _____ = 24

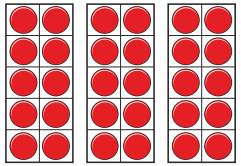
- Complete the sentences to describe the equal groups.



_____ + _____ + _____ + _____ + _____ = 15

_____ × _____ = 15

- Complete the number sentence to describe the equal groups.



_____ + _____ + _____ = _____ × _____

- Complete the table.

Sentence	Picture	Addition	Multiplication
There are 3 equal groups with 2 in each group.			

Introduce the multiplication symbol

Reasoning and problem solving

Jo puts some counters into equal groups.

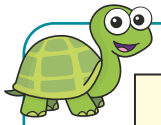
There are 12 counters in total.

What could the addition and multiplication number sentences be?

multiple possible answers, e.g.

6 + 6 = 12
2 × 6 = 12

4 + 4 + 4 = 12
3 × 4 = 12



$3 + 3 + 3 = 3 \times 3$

Is Tiny correct?

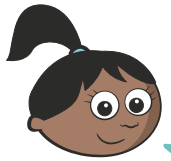
How do you know?

Draw a picture to help you.

Yes

picture showing 3 groups of 3

Sam and Ron are talking about multiplication stories.

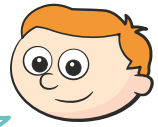


Sam

There are 4 trees with 3 birds in each tree.

Write an addition and a multiplication for Sam's story.

The multiplication for my story is 6 x 5



Ron

What is the addition for Ron's story?

What could Ron's story be?

3 + 3 + 3 + 3

4 × 3

5 + 5 + 5 + 5 + 5 + 5

Multiplication sentences

Notes and guidance

In this small step, children continue to develop their understanding of the multiplication symbol in calculations, but now with more emphasis on finding the answers.

This step mainly uses pictures to support understanding and the language of "lots of" and "groups of". These should be used alongside the multiplication symbol to help develop children's familiarity with the symbol. Children identify the multiplication number sentences and draw pictures that represent them or express them as word problems.

Although pictures may show, for example, 4 lots of 3, children may discover that multiplication is commutative, and this idea could be explored. Commutativity is covered in more detail in the next step when looking at arrays.

Things to look out for

- Children may mix up describing "5 lots of 3" and "3 lots of 5", as the totals are the same.
- At this point, children may not recognise that, for example, 4 × 3 gives the same total as 3 × 4
- Children may find it more challenging to draw a picture to represent a multiplication than to identify the multiplication from a picture.

Key questions

- What can you see in the picture?
- How many equal groups can you see?
  How many are in each group?
- What does the symbol mean?
- What do the numbers represent?
- How many ways can you describe the picture?
- If the answer is _____, what could the multiplication be?
- Can you draw a picture to show this multiplication?

Possible sentence stems

- _____ lots of _____ = _____
- _____ groups of _____ = _____
- _____ × _____ = _____

National Curriculum links

- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Multiplication sentences

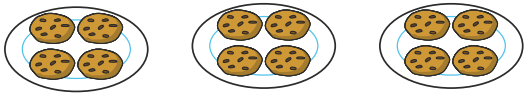
Key learning

- Complete the sentences to match the picture.

_____ lots of 3 = 12

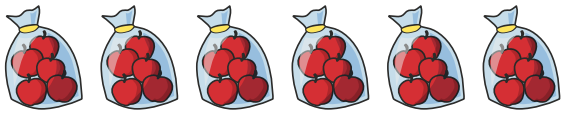
_____ × _____ = 12

- Complete the sentences to match the pictures.



_____ lots of _____ = _____

_____ × _____ = _____



_____ lots of _____ = _____

_____ × _____ = _____

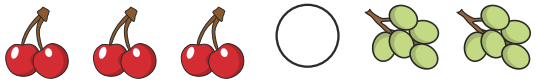
- Draw a picture to match each label.

3 lots of 2	5 × 7	7 × 5

- Complete the table.

Picture	Multiplication	Sentence
	4 × 10 = 40	4 lots of 10 is equal to 40
	35 = 7 × 5	
		6 lots of 3 is equal to 18

- Write <, > or = to complete the statements.



4 lots of 3 ◯ 

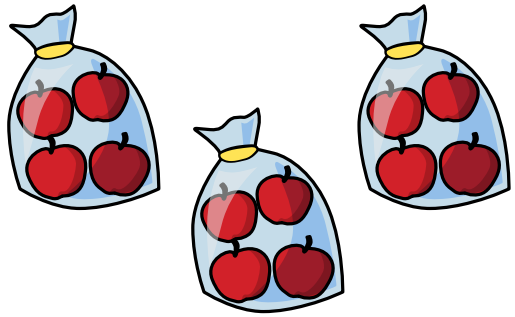
 = 1 × _____

Compare methods with a partner.

Multiplication sentences

Reasoning and problem solving

The picture shows 3 lots of 4



Draw a picture to show 4 lots of 3

How many apples are there in each picture?

What is the same about the multiplications?

What is different about the multiplications?

12 apples

The answer to a multiplication question is 18

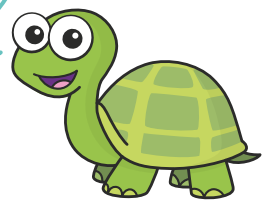
What could the multiplication be?

□ × □

How many possible questions can you find?

1 × 18, 2 × 9, 3 × 6, 6 × 3, 9 × 2, 18 × 1

10 × 2 must be greater than 4 × 5, because 10 is greater than 5



Do you agree with Tiny?

Explain your answer.

No

Use arrays

Notes and guidance

In this small step, children use arrays for the first time in this block. This step focuses on the fact that multiplication is commutative and children should be encouraged to identify the two multiplication sentences that can be seen in an array.

Concrete resources should be used to help identify different sets of equal groups. Discuss why an array is a useful and efficient tool to calculate a multiplication and encourage children to draw arrays to represent the multiplication.

While the multiplication symbol is used more frequently, links should still be made to repeated addition and the language previously used to describe multiplication.

Children use arrays throughout the rest of the block to solve multiplication and division calculations.

Things to look out for

- Children may make mistakes when drawing arrays. For example, children may leave a hole in their array, and so not represent the multiplication correctly.
- Children may not recognise that, for example, 3 × 4 = 4 × 3
- Children may not see the different sets of equal groups in an array.

Key questions

- How can you organise the counters to help you find the total?
- How many rows are there?
- How many columns are there?
- What multiplication can you see in the array?
- What two multiplication sentences can you see?
- Is it easier to count in _____ s or _____ s to find the total?
- Why do 3 × 2 and 2 × 3 have the same total?

Possible sentence stems

- There are _____ rows and _____ columns.
- In this array, I can see _____ × _____ and _____ × _____
- There are _____ × _____ = _____ altogether.

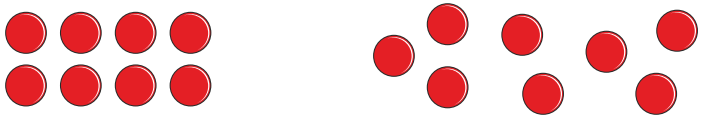
National Curriculum links

- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

Use arrays

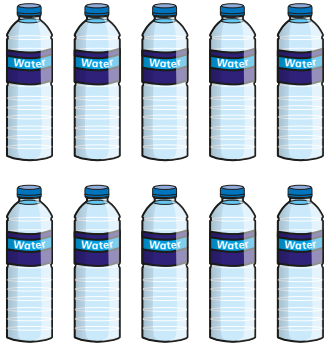
Key learning

- Look at the two groups of counters.



What is the same? What is different?
Which group of counters is easier to count? Why?

- Complete the sentences to match the picture.



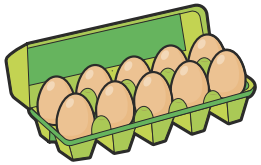
_____ + _____ = _____

_____ × _____ = _____

There are _____ water bottles.

Can you see a different repeated addition and multiplication in the picture?

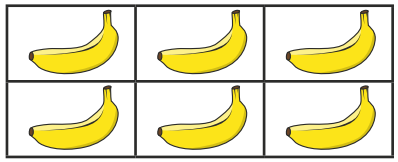
- Look at the picture.



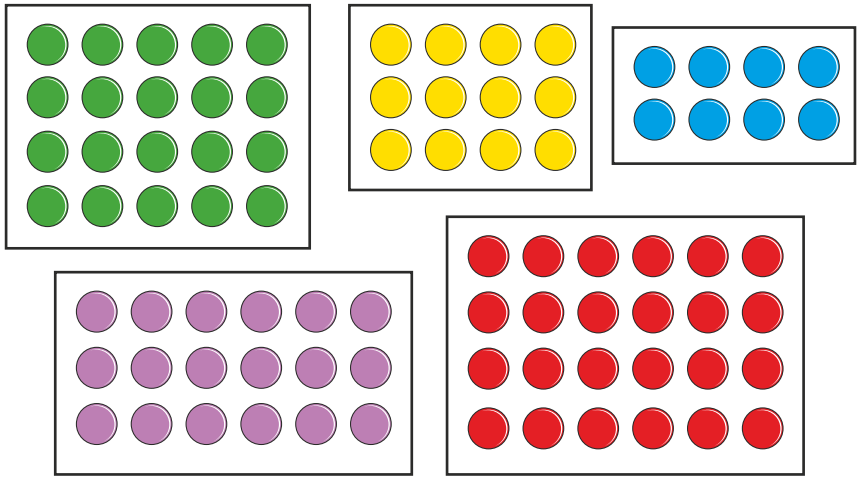
Find 2 × 5 and 5 × 2

Draw an array of counters to match the picture.

- Write two addition sentences and two multiplication sentences for the array.



- Write two addition sentences and two multiplication sentences for each array.



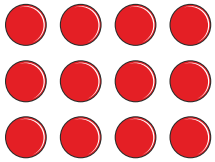
- Draw as many arrays as you can to show 16

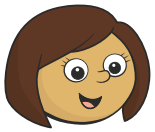
What do you notice?

Use arrays

Reasoning and problem solving

Kim and Max are looking at this array.





The array shows 3 × 4

Kim

The array shows 4 × 3

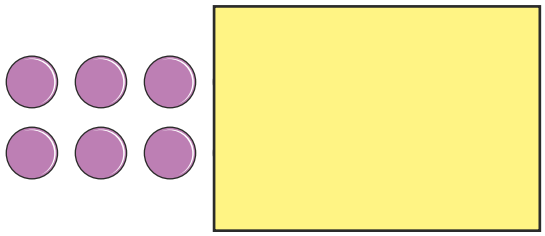
Max

They are both correct.

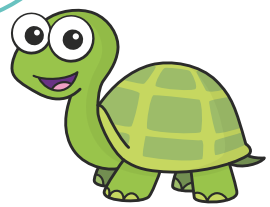
Who is correct?

How do you know?

Tiny has hidden part of an array.



There are fewer than 16 counters in total.



2 × 4

2 × 5

2 × 6

2 × 7

What could the array be?

Talk about it with a partner.

Make equal groups – grouping

Notes and guidance

Now that children have looked in detail at multiplication, in this small step they use their knowledge of equal groups to support them in developing their understanding of division. This is the first time within this block that children have looked at division.

Children put objects into groups of a certain amount rather than sharing into equal groups, which is covered in the next step. They are introduced to the division symbol for the first time, and this should be supported by language and sentence stems rather than just written in an abstract calculation. An interesting discussion point is what each number in the division calculation represents and this can be considered further in the next small step when looking at division as sharing.

Children should also be able to make links between multiplication and division.

Things to look out for

- Children may mix up grouping and sharing.
- If circling groups, children may not do this in an efficient way and may end up with objects left over at both ends of the image.
- Children may think that as multiplication is commutative, division must be too.

Key questions

- How many do you have altogether?
- How many are you going to put into each group?
- How many groups do you have?
- What does the symbol mean?
- What does each number represent?
- How can you use a number line to show equal groups?
- How are multiplication and division linked?

Possible sentence stems

- There are _____ altogether.
  I have put them into equal groups of _____
  There are _____ groups.
- _____ ÷ _____ = _____

National Curriculum links

- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Make equal groups – grouping

Key learning

- Take 15 counters.

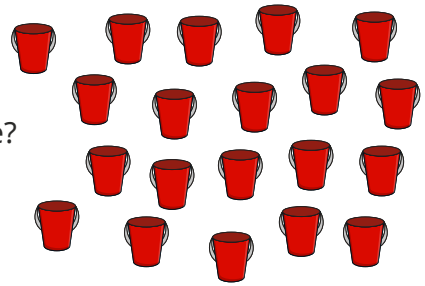
  - Put them into groups of 3
  - Complete the sentences.

    There are 15 counters.

    The counters are in groups of _____

    There are _____ groups.

- There are 20 buckets.



  - Circle groups of 5

    How many groups did you circle?
  - Complete the number sentence.

    20 ÷ 5 = _____

  Does it matter how you circle the groups of 5?

- Ben has 12 cookies and some plates.

  He puts 3 cookies on each plate.

  How many plates does Ben have?

  Use cubes or counters to show your answer.

- Ann has 20 pencils.

  She wants to put 10 pencils in each pot.

  Complete the sentences to show how many pots Ann needs.
  You could draw a picture to help you.

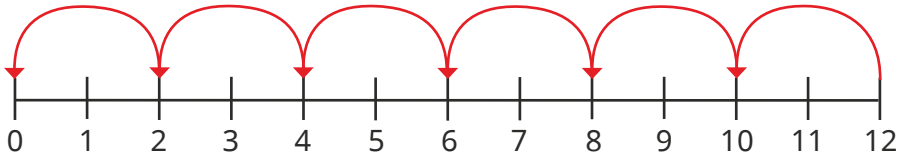
  There are _____ pencils altogether.

  There are _____ pencils in each pot.

  There are _____ pots.

  _____ ÷ _____ = _____

- Tom uses a number line to work out how many equal groups of 2 he can make from 12



  - Complete the sentences.

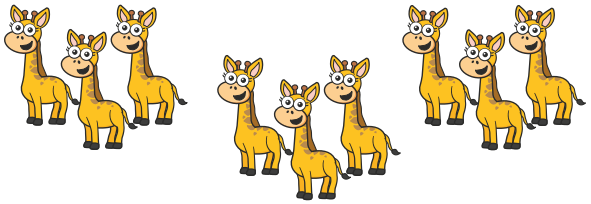
    12 is made up of _____ equal groups of _____

    12 ÷ 2 = _____
  - Use a number line to work out 15 ÷ 3

Make equal groups – grouping

Reasoning and problem solving

Write a division and a multiplication to match the picture.



What do you notice?

$9 \div 3 = 3$
$3 \times 3 = 9$

Dan has 30 stickers.

He groups the stickers, so that there is the same number of stickers in each group.

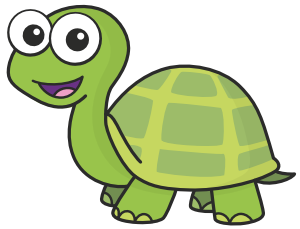
What groups could Dan have made?

Talk about it with a partner.

multiple possible answers, e.g.
10 groups of 3
5 groups of 6

Tiny has made 5 equal groups of counters.

I started with more than 10 counters, but fewer than 35 counters.



How many counters could Tiny have started with?

How many counters will there be in each group?

Compare answers with a partner.

15 counters in 5 groups of 3

20 counters in 5 groups of 4

25 counters in 5 groups of 5

30 counters in 5 groups of 6

Make equal groups – sharing

Notes and guidance

In this small step, children explore division through sharing.

Children should firstly explore this using concrete resources and physically sharing between groups. They could explore the generalisation that the greater the number they are dividing by, the smaller the answer. Bar models and pictures are also used to support children in completing the calculations. When dividing larger numbers, children could use base 10 and this may be a useful opportunity to recap place value and exchanging.

Children could also compare sharing and grouping and think about what the numbers represent in each structure. They use both grouping and sharing later in the block when dividing by 2, 5 and 10

Things to look out for

- Children may mix up grouping and sharing.
- Children may not count the number in each group to find the answer.
- When using base 10, children may not exchange, so they may think that they cannot complete calculations or will complete them inaccurately.

Key questions

- How many do you have altogether?
- How many groups are you going to share them between?
- How many does each group have?
- What does this symbol (÷) represent?
  What does each number represent?
- Can you draw a picture to represent this calculation?
- How is sharing different from grouping? How is it similar?

Possible sentence stems

- There are _____ altogether.

  There are _____ equal groups.

  There are _____ in each equal group.
- _____ shared equally between _____ groups is equal to _____

  _____ ÷ _____ = _____

National Curriculum links

- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Make equal groups – sharing

Key learning

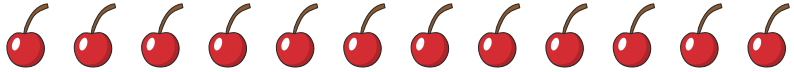
- Take 10 counters.
  - Share them into 2 equal groups.
  - Complete the sentences.

    There are 10 counters.

    There are _____ equal groups.

    There are _____ in each equal group.
  - If you share the counters into 5 equal groups, how do the sentences change?

- Kay has 12 cherries.



She shares them equally between 3 plates.

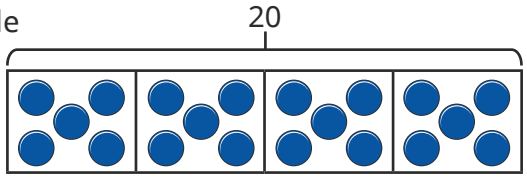
Show how Kay shares the cherries.

How many cherries are on each plate?

- Ben uses a bar model to divide 20 into 4 equal groups.

How does Ben's bar model show the question?

How does it show the answer?



- Share 12 cubes equally between 4 boxes.

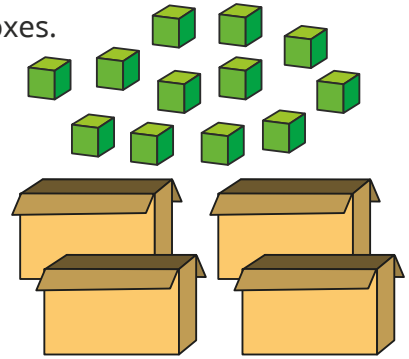
Complete the sentences.

There are _____ cubes altogether.

There are _____ boxes.

There are _____ cubes in each box.

12 ÷ _____ = _____



- 24 children are put into 6 equal teams.

How many children are in each team?

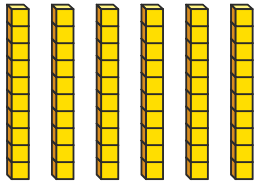
Use counters to show this.

- Use base 10 to help you work out the divisions.
  - 60 ÷ 6
  - 60 ÷ 3
  - 60 ÷ 2
  - 60 ÷ 5
  - 60 ÷ 10
  - 60 ÷ 4

Which did you find the easiest?

Which did you find the hardest?

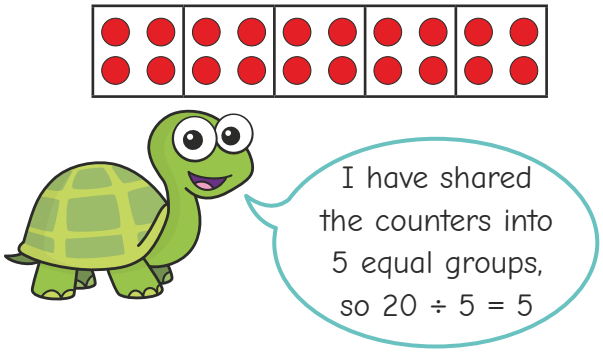
Talk about it with a partner.



Make equal groups – sharing

Reasoning and problem solving

Tiny uses a bar model to work out 20 ÷ 5

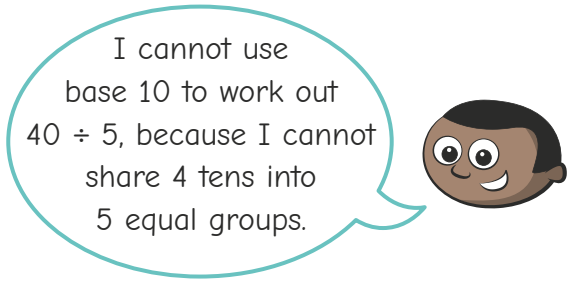


Do you agree with Tiny?

Why?

No

Mo is working out 40 ÷ 5



Do you agree with Mo?

Why?

No

Write a story to match the division.

$30 \div 5 = 6$

Is your story sharing or grouping?

Compare stories with a partner.

multiple possible answers

Ann has 20 sweets and shares them between 5 friends.

Tom has 20 sweets and shares them between 10 friends.

Whose friends get more sweets?

How do you know?

Ann's friends

The 2 times-table

Notes and guidance

This small step uses skills from previous steps and from counting in 2s, 5s and 10s from the Place value block. Children explore the 2 times-table and start to become more fluent in this. This step focuses mainly on multiplication, with division covered in more detail in the next step.

Children explore the 2 times-table in a range of ways, and it is important that children are exposed to multiple representations. They should use concrete resources as well as number tracks, number lines and bar models. They will have the opportunity to practise using these representations again later in the block.

When calculating, children should be encouraged to find efficient strategies rather than always counting from 1 × 2

Things to look out for

- Children may add the two numbers together, rather than multiplying them.
- Children may always start from the first number in the times-table, instead of starting from a known fact.
- Children may be less confident in some representations than others.

Key questions

- How can you show counting in 2s?
- How do you know what _____ lots of 2 are?
- Would drawing a picture help you to work out the multiplication?
- What do you need to do with the two numbers in the number sentence?
- Do you always need to start counting from 2?
- If you know what 5 × 2 is, how can you work out 6 × 2?
- If you know what 10 × 2 is, how can you work out 9 × 2?
- Can you show the multiplication another way?

Possible sentence stems

- _____ × 2 is the same as _____ lots of 2
- _____ multiplied by 2 is equal to _____
- I know that _____ × 2 = _____, so I can add/subtract 2 to work out _____ × 2

National Curriculum links

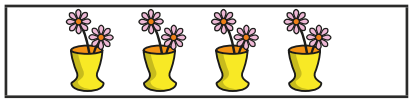
- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

The 2 times-table

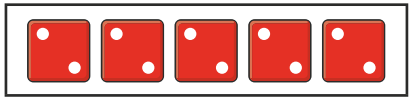
Key learning

- Match the pictures to the multiplications.

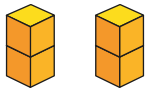
4 × 2



5 × 2



3 × 2

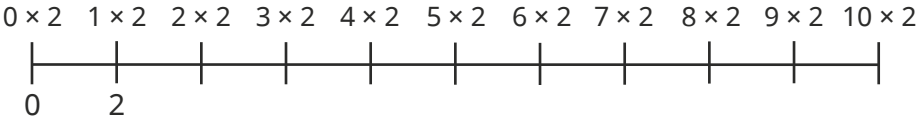
- Write a multiplication sentence to match each picture.
  - 
  - 
- How many wheels are there on five bicycles?

- Complete the number tracks.

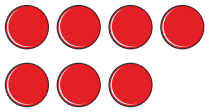
2	4		8		12

14	16	18			24

- Complete the number line.



- Complete the array to work out the multiplication.



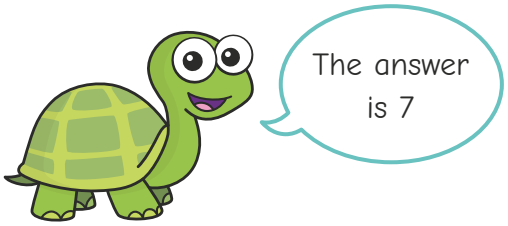
9 × 2 = _____

- Complete the multiplications.
  - 4 × 2 = _____
  - 2 × 10 = _____
  - _____ = 12 × 2
  - 8 × 2 = _____
  - 2 × _____ = 18
  - _____ × 2 = 6

The 2 times-table

Reasoning and problem solving

Tiny is working out 5 × 2



Is Tiny correct?

How do you know?

No

Write <, > or = to compare the statements.

5 × 2 ◯ 7 × 2

2 × 8 ◯ 18

6 × 2 ◯ 8 + 4

<

<

=

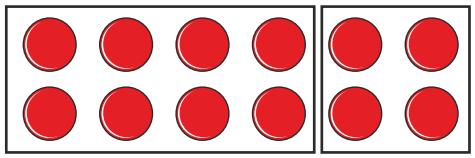
Kay has 7 cookies.

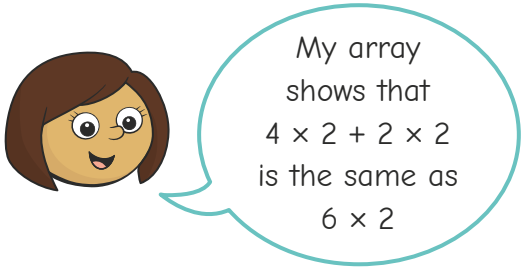
Max has twice as many cookies as Kay.

How many cookies does Max have?

14

Kim uses counters to show 6 × 2





What else does Kim's array show?

multiple possible answers, e.g.

6 × 2 = 1 × 2 + 5 × 2

Divide by 2

Notes and guidance

Following on from the previous step, children use their knowledge of the 2 times-table to divide by 2

Children should be aware of the differences between the grouping and sharing structures of division. Divisions are shown using pictures as well as concrete resources to help children work out the calculations. Children use sentence stems alongside number sentences using the division symbol.

While it is important that children use concrete resources, they should also be aware that they can use the 2 times-table to help them fluently divide by 2, in the abstract. Children should be encouraged to spot patterns to help them complete calculations efficiently.

Things to look out for

- Children may not be confident with the 2 times-table.
- Children may confuse grouping and sharing.
- When using a number line, children may believe that the answer is always zero, as this is the number they will finish on.
- Children may be over-reliant on practical resources and not use their times-table knowledge.

Key questions

- How can the 2 times-table help you?
- How are division and multiplication linked?
- Will you be grouping or sharing for this question? How do you know?
- How can making/drawing an array help you?
- How many groups of 2 can you make?
- How can you share this between 2 equal groups?
- How can you use a number line to complete the division?
- If you know what 20 divided by 2 is, what is 10 divided by 2?

Possible sentence stems

- There are _____ altogether.
  There are _____ in each group.
  There are _____ groups.
- _____ divided by 2 is equal to _____

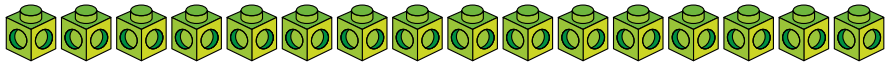
National Curriculum links

- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

Divide by 2

Key learning

- Use 16 cubes.



  - Put them into groups of 2 and complete the sentence.

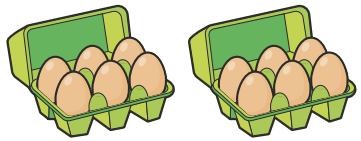
    There are _____ equal groups of 2

  - Share them into 2 equal groups and complete the sentence.

    There are _____ cubes in each equal group.

  How are grouping and sharing different? How are they similar?

- Complete the sentences.



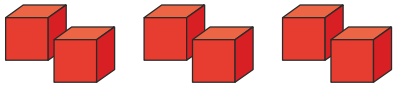
  There are 12 eggs altogether.

  There are _____ groups.

  There are _____ eggs in each group.

  12 ÷ 2 = _____ _____ × 2 = 12

- Complete the sentences.



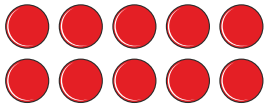
  There are _____ cubes altogether.

  There are _____ cubes in each group.

  There are _____ groups.

  _____ ÷ _____ = _____ _____ × _____ = _____

- Use the arrays to complete the number sentences.



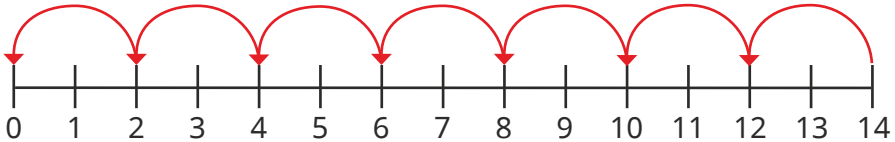
  _____ × 2 = 16

  16 ÷ 2 = _____

  _____ × 2 = _____

  _____ ÷ 2 = _____

- Use the number lines to work out the divisions.



  14 ÷ 2

  10 ÷ 2

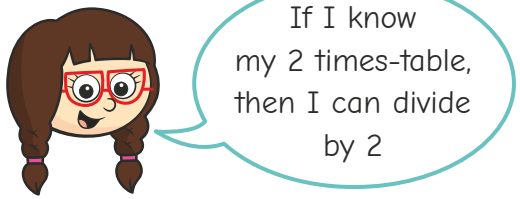
- Dan and Fay share 12 sweets between them equally.

  How many sweets does each child get?

Divide by 2

Reasoning and problem solving

Jo is dividing by 2



Do you agree with Jo?

Why?

Yes

Ben has 24p.
He divides it equally between 2 friends.
How much will they each get?

Ben has 24p in 2p coins.
How many 2p coins does he have?

What is the same about the two questions? What is different?

12p

12 coins

Tom shares some grapes equally between two friends.

Each friend gets more than 30 grapes, but fewer than 50 grapes.

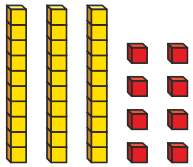
Complete the sentences to describe the number of grapes Tom started with.

He could have started with _____ grapes.

He cannot have started with _____ grapes.

Tom could have started with any even number of grapes between 62 and 98 grapes.

Tiny is working out
38 ÷ 2



How can Tiny use the base 10 to work out the division?

19

Doubling and halving

Notes and guidance

In this small step, children double and halve numbers.

Introduce the concept using concrete resources and pictures to show halves and doubles. Guide them towards the connection that when they double a number, they multiply by 2 and when they halve a number, they divide by 2

Children also use pictures to identify when a number has or has not been doubled or halved; misconceptions, such as thinking that doubling means adding 2, could be explored at this point.

Once children are secure in their understanding of doubling and halving, they can look for patterns and try to predict answers based on known facts, for example "If I know what double 2 is, I can find double 20"

Some children may try to halve odd numbers, which is something that can be explored with concrete resources.

Things to look out for

- Children may not make the connection between doubling and halving and the 2 times-table.
- Children may be over-reliant on manipulatives or pictures to double or halve, rather than multiplying or dividing by 2

Key questions

- What does "double" mean?
- What does "halve" mean?
- How do you double a number?
- How do you halve a number?
- How can you use counters to help you double a number?
- Can you write this as a number sentence?
- How is doubling linked to the 2 times-table?
- How is halving linked to the 2 times-table?

Possible sentence stems

- Double _____ is _____
- Half of _____ is _____
- Double _____ is _____, so double _____ is _____
- Half of _____ is _____, so half of _____ is _____

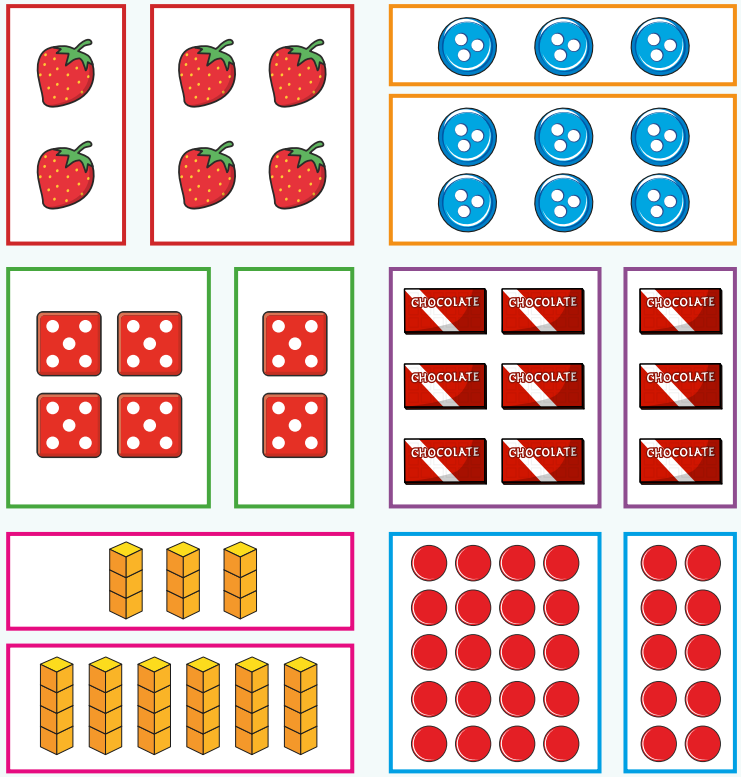
National Curriculum links

- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

Doubling and halving

Key learning

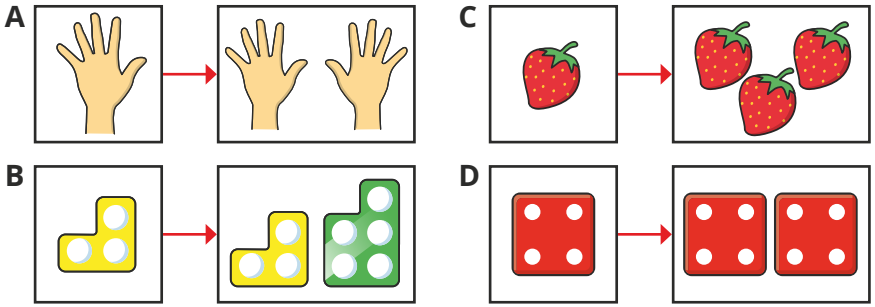
Show children the sets of pictures.



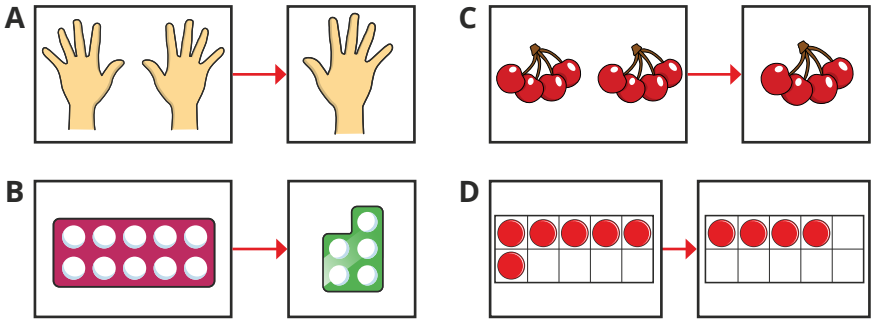
Discuss what the pictures show.

Identify with children whether each set of pictures shows doubling, halving or neither.

- Which pictures show doubling?



- Which pictures show halving?



- Write a multiplication or division number sentence to match the labels.

double 7	half of 14	double 12	half of 24

What do you notice about your answers?