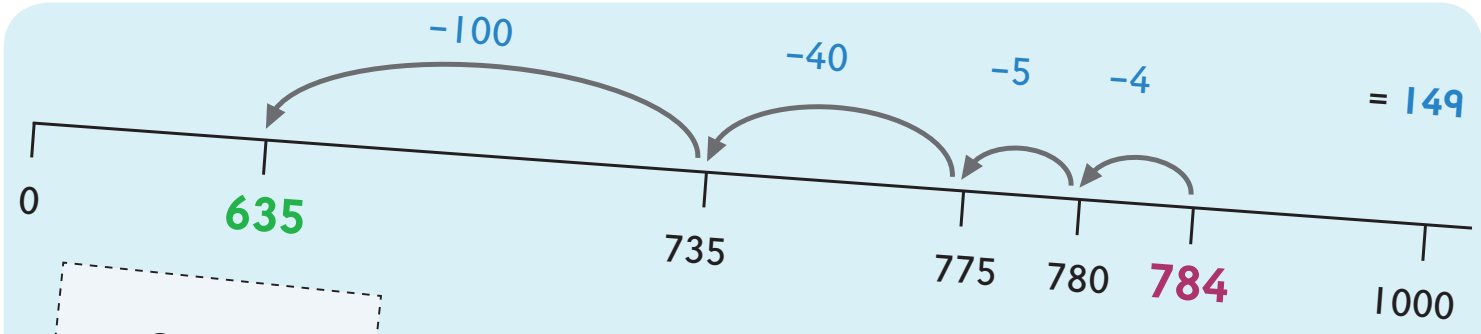


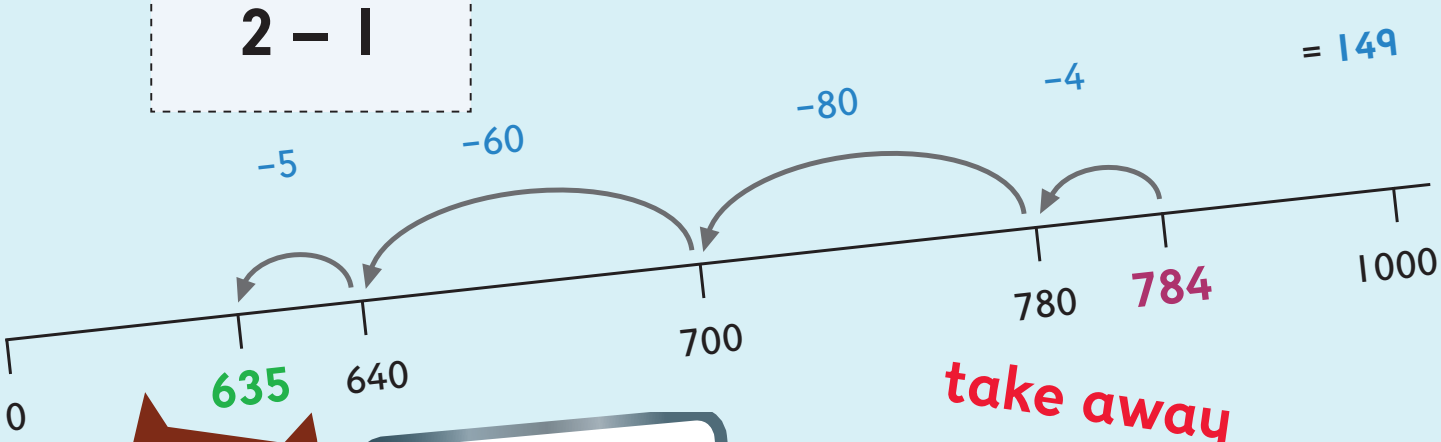
8 – 5

5 – 3

2 – 1

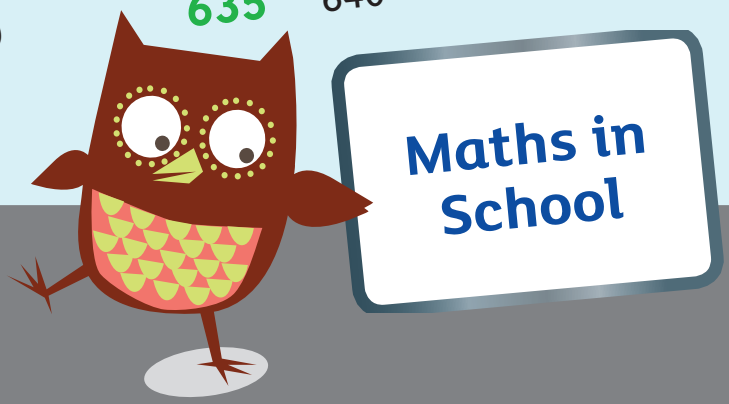
how many left?

what's the difference?



take away

minus



Subtraction in School

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Oxford OWL www.oxfordowl.co.uk

OXFORD

Subtraction in School

Contents

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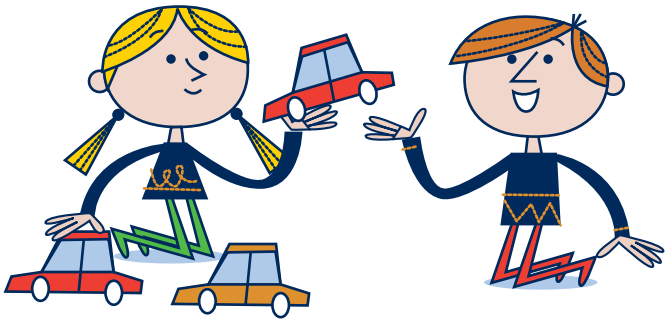
Introduction

In this booklet, you'll find out how children are taught to subtract in school. You'll also find a range of games and activities that you can use at home to build your child's skills and confidence at subtracting.

Subtracting in everyday life

Real life is full of opportunities for children to subtract, e.g. lending some toys to a friend and calculating how many toys will be left, spending some money and working out how much money they should still have. Problems like this – about real things that children can see and touch – bring subtraction to life.



Teachers often ask children to solve life-like problems because it's not numbers and signs on a page that children most need to deal with in life, but real events.

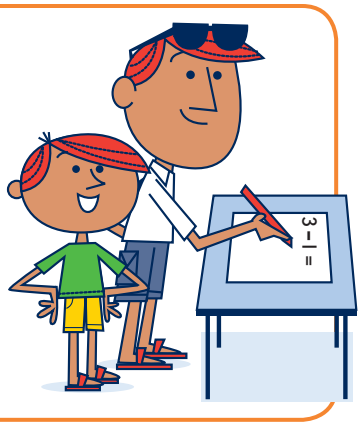
The more we encourage our children to tackle such questions at home, the easier they'll find them both at home and at school.

You can:

- *Ask questions like:*

  'You have 3 toy cars. How many will you have left if you let Charlie play with 1?'

  'We had £15 of holiday spending money. We've spent £7.46. How much should we have left?'



Different words for subtraction

At home and at school, children will come across lots of different words that mean subtraction:

take away

how many left?

minus

how many more?

less

less than

what's the difference?

This can be confusing at first. For example, the word 'more' appears to be about ***adding*** something on, so phrases like 'How many more … ?' in questions such as 'How many more does he have than you?' can ***seem*** to call for an addition calculation. It takes lots of experience for children to remember that each time they hear these words they need to ***subtract***. The more we use such words and phrases with our children, the easier they'll find it when they come across them in school.

You can:

- *Ask subtraction questions using a variety of phrases, e.g.*

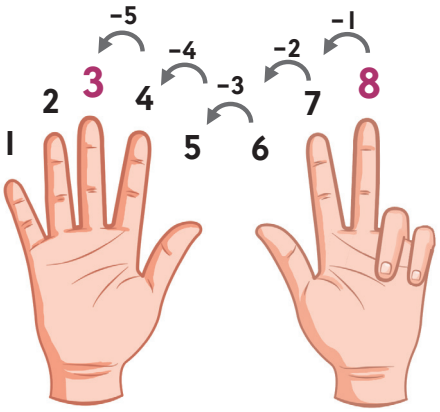
  'You have 5 potatoes and Mina has 3 potatoes. How many more do you have?'

  'This sweet costs 10p and that sweet costs 15p. What's the difference in their prices?'

Counting backwards

Children are first taught to subtract by ***counting backwards.*** In this method, we start from the highest number and count backwards. Look at this example using fingers to help count back:

8 – 5 = ?



Start from finger **8**.

Count **back 5** fingers.

See where we land: on finger **3**.

8 – 5 = 3

Songs and rhymes

Lots of songs help our children to count backwards. Just singing these songs with our children is a great activity. We can also show them how to use their fingers, or toys, as props to help with the songs.

You can:

- *Print out the Five Little Ducks song and picture cards on pages 22–23. Cut out the five duck pictures. Keep them as they are, or stick them to cardboard, and help your child to use them as props as you sing it together.*
- *With your child, make your own props to go with other subtraction songs such as 'Five Little Monkeys Jumping on the Bed', 'There were 10 in the bed', 'Five Little Speckled Frogs', or just enjoy singing these songs together.*

Subtraction cannot be done in any order

Unlike addition, subtraction calculations cannot be done in any order:

7 – 4 is not the same as 4 – 7

Children may need help remembering this.

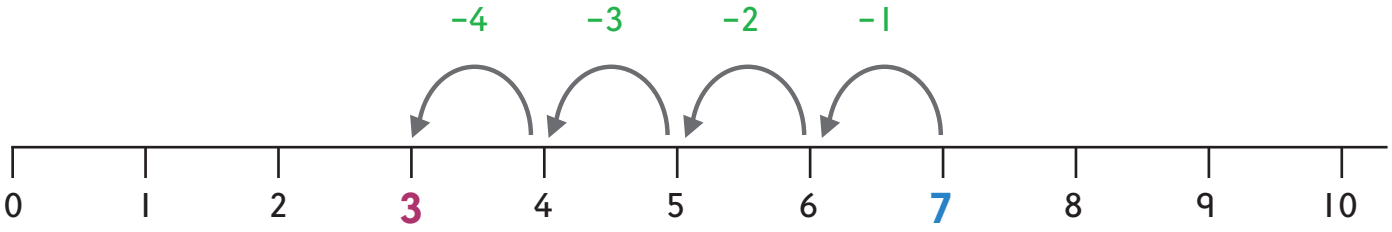
Number lines

Children will move from subtracting real things, counters and pictures of things to subtracting written numbers. They'll practise lots of methods to make this easier, including the use of a number line.

A number line is simply a line with numbers on it that can help with calculations. Look at this subtraction question:

7 – 4 = ?

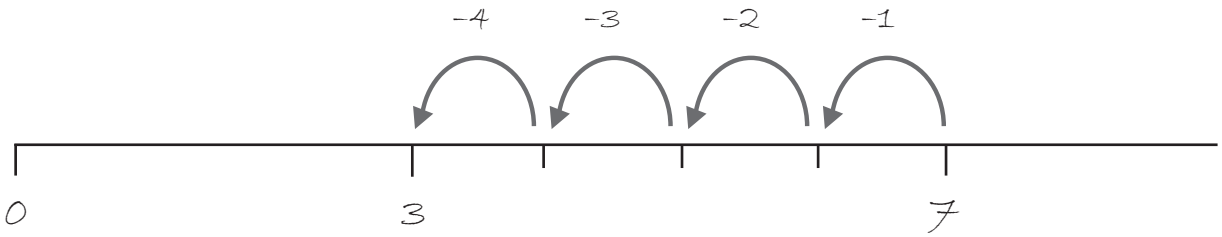
Working backwards on a number line…



7 – 4 = 3

Blank number lines

Blank number lines are number lines that start without any numbers on. We add our own numbers as we need them in a calculation:



$7 - 4 = 3$

You can:

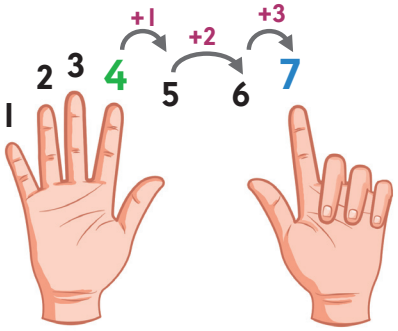
- *Help your child to use the number lines on page 24 to subtract. They can use a counter (page 25), pencil or finger to keep track of their place as they hop backwards down the numbers.*
- *Draw your own number lines with your child. Here are some tips:*
  - *Always include 0 on your number line. (Forgetting about 0 can get children into a real muddle!)*
  - *Start by drawing them pretty big, with a nice gap between each number.*
  - *Blank number lines, on which you just write in the numbers that you need to remember as you do a calculation, are great to move on to when your child is ready.*

Counting on

As well as learning how to subtract by counting backwards, children will be shown how to subtract by ***counting on***. In this method, we start with the number to be taken away (usually the smaller number) and then see how many we need to add on, or ***count on***, to reach the bigger number.

So the question: $7 - 4 = ?$

becomes: $4 + ? = 7$



$4 + 3 = 7$

so: $7 - 4 = 3$

Counting on and number bonds

Turning subtraction questions into addition questions, as we do in the counting on method, can help children to use their addition knowledge to solve subtraction problems.

In particular, they can use their memory of **number bonds** to fill in the missing number in a calculation. Numbers bonds are basic addition questions that we learn to answer instantly, without having to work out the answers in our heads. For more information and tips about number bonds, see the Addition in School Booklet.

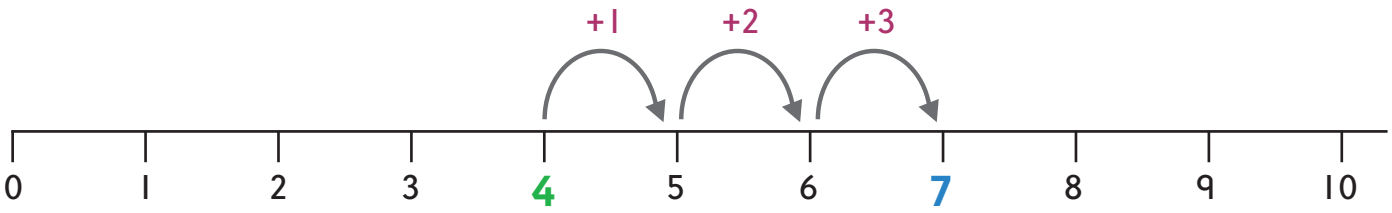
You can:

- *Help your child if they are struggling with a subtraction question by seeing if they can turn it into an addition question and then use counting on, or their memory of number bonds, to find the answer.*

Counting on and number lines

When counting on, children can use number lines to keep track of where they are in a calculation:

So 7 – 4 = ? becomes 4 + ? = 7



4 + 3 = 7

7 – 4 = 3

You can:

- *Help your child to use the counting on method with the number lines and counters provided or make your own number lines to use with this method.*

Remembering subtraction facts

Just as learning addition number bonds by heart can help children with both addition and subtraction problems, learning basic subtraction facts by heart can also help children answer subtraction questions quickly and easily. Games, activities and lots of practice can help with this.

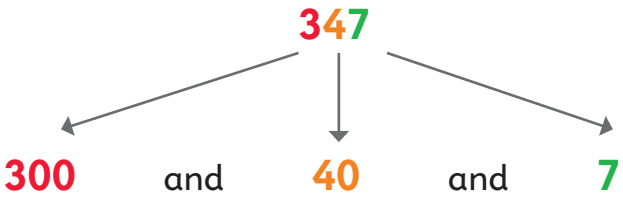
You can:

- *Print and play Subtraction Bingo (pages 28–34).*
- *Make your own Subtraction Bingo game for subtraction questions with answers up to 20.*
- *Make your own flash cards for other games, such as Pairs or Snap, so that your child has to match basic subtraction questions to the answer (e.g.* **9 – 5** *and* **4***).*

Partitioning

To help with subtracting larger numbers, children are often taught a skill called **partitioning**. Partitioning means splitting a number up into smaller bits to make calculations easier. Usually, we split numbers up into hundreds, tens and units.

So,



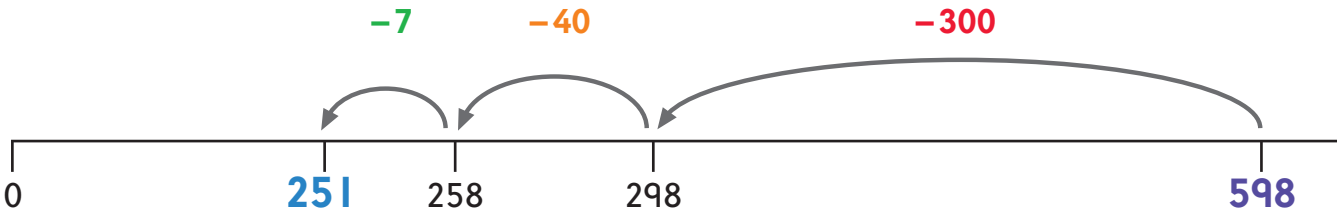
You can:

- *Encourage your child to partition numbers over 10 that you see around you – in shops, adverts, game scores, etc.*

Partitioning to subtract

To subtract **347** from another number, say **598**, we can do it in little bits rather than trying to do it in one go.

Here's the calculation on a number line. Be aware that the calculation is going backwards – from right to left along the number line, as shown by the arrows:



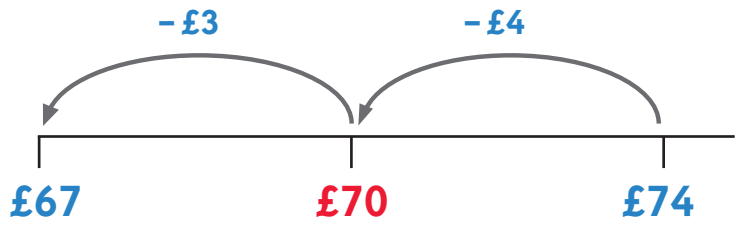
598 − 347 = 251

Partitioning and bridging

Children don't just have to split numbers into tens, hundreds and units. They can split them in any way that's going to make the calculation easier.

Many subtraction calculations involve having to subtract past a multiple of 10, e.g. 20, 30, 40, 100, 200, 300, etc.

Let's look at this example: to calculate **£74 – £7**, we have to go past £70. Rather than counting backwards £7 from £74 in one go, many children will find it easier to use £70 as a bridge, or stepping stone, in the calculation.



They subtract to **£70** first, which means using up **£4** out of the **£7**, and then they subtract whatever is left out of the **£7**, so **£3**. This takes them to the final answer: **£67**.

You can:

- *Help your child if they are struggling with a subtraction question; look together for a multiple of 10 that could be a useful bridge, or stepping stone, to break up the calculation into easier steps.*

Partitioning and counting on

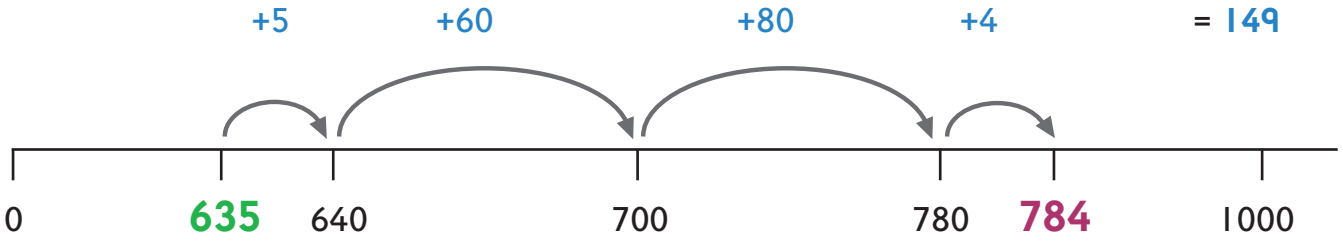
Partitioning can also be used when you are using the counting on method of subtraction:

e.g. **784 – 635**

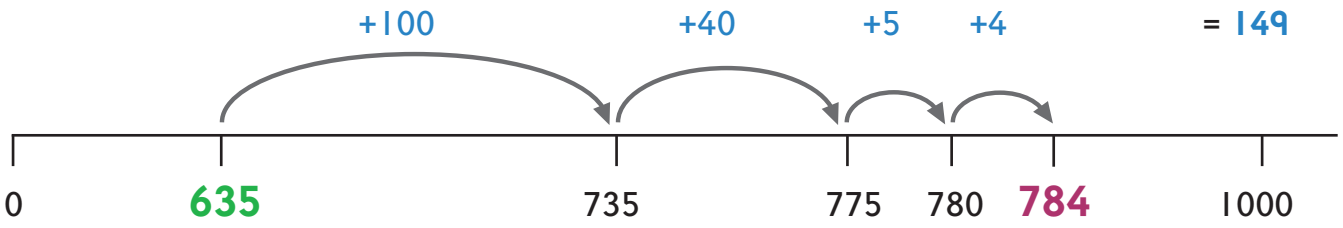
(or **635 + ? = 784**)

Here are just some of the ways that children might choose to do this bigger calculation, using number lines and partitioning:

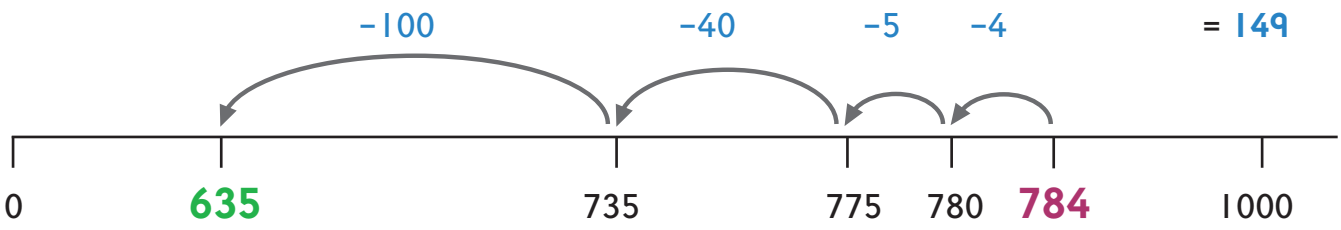
Counting on



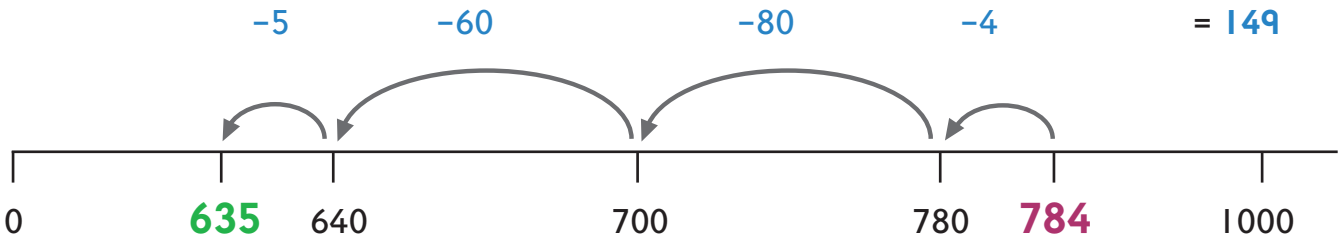
Or counting on again



Or counting backwards



Or counting backwards again



You can:

- *Help your child to explore a range of different subtraction methods on a number line.*

The expanded method

Your child may be introduced to another subtraction method, sometimes called the expanded method. In this method, numbers are partitioned into hundreds, tens and units and placed in columns:

784 – 35

becomes

	700	80	4
–	000	30	5

We start with the units. We cannot take 5 from 4 without using negative numbers, which children may not be familiar with at this stage, so we need to borrow one lot of 10 from the tens column and give it to the units column, like this:

		70	14
	700	~~80~~	~~4~~
–	000	30	5
	700 +	40 +	9

We can now take the **5** from the **14**:

14 – 5 = 9

Next, moving to the tens column, we can take the **30** from the **70**:

70 – 30 = 40

Then, in the hundreds column, we take the **000** from the **700**:

700 – 000 = 700

Finally, we add the results together: **700 + 40 + 9 = 749**

784 – 35 = 749

Column subtraction and borrowing

Children are shown how to place large numbers straight into columns (without partitioning) and then subtract one from another. This method is called **column subtraction.**

Depending on the numbers in the calculation, children are sometimes required to use a technique called **borrowing** (you may also hear this referred to as exchanging or regrouping). The example below shows column subtraction *and* borrowing:

Imagine we've got **£273** and we want to buy a bike for **£145.** To work out how much we'd have left, we need to do a subtraction calculation:

£273 – £145

To do this we can put the numbers in columns like this:

$$\begin{array}{r} £273 \\ -\ £145 \\ \hline \end{array}$$

For calculations in columns, always line up the single units (the 3 and the 5 in this calculation), line up the tens (the 7 and the 4), line up the hundreds (the 2 and the 1) and so on.

Start with the numbers on the far right – in this case the units.

So, our first calculation is 3 – 5. But we can't take 5 from 3 because 5 is greater than 3. So, we have to **borrow**: we take 1 lot of ten from the 7 lots of ten and add it to the 3 units, like this:

$$\begin{array}{r} £2\overset{6}{\cancel{7}}\overset{1}{}3 \\ -\ £145 \\ \hline \end{array}$$

The 7 lots of ten become 6 lots of ten and the 3 units become 13 units.

So now our calculation is 13 – 5. We can do this because 13 is bigger than 5: **13 – 5 = 8**. We write the answer 8 under our units:

$$\begin{array}{r} £2\overset{6}{\cancel{7}}\overset{1}{}3 \\ -\ £145 \\ \hline 8 \\ \hline \end{array}$$

Next, we move to the tens. We need to take the 4 lots of ten away from the 6 lots of ten we have left: **6 – 4 = 2**. We write the answer 2 under our tens:

$$\begin{array}{r} £\,2\,{}^{6}\!\not{7}\,{}^{1}3 \\ -\,£\,1\,4\,5 \\ \hline 2\,8 \\ \hline \end{array}$$

Finally, we move to the hundreds: 2 hundreds – 1 hundred = 1 hundred. We write the answer 1 under our hundreds:

$$\begin{array}{r} £\,2\,{}^{6}\!\not{7}\,{}^{1}3 \\ -\,£\,1\,4\,5 \\ \hline £\,1\,2\,8 \\ \hline \end{array}$$

£273 – 145 = £128

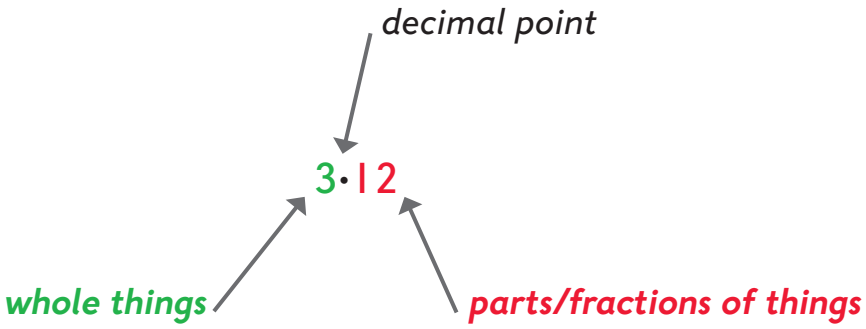
If we buy the bike, we'll have **£128** left.

You can:

- *Print the digits and lines on pages 26–27, cut them out and use them, instead of pen and paper, when trying column subtraction calculations.*
- *When they're ready, encourage your child to try column subtraction when shopping or budgeting.*

Decimal numbers

Children will be introduced to decimal numbers.



3·12 is a decimal number: it has a decimal point.

Digits before the decimal point (the **3**) are whole numbers that represent whole things.

Digits after the decimal point (the **1** and **2**) represent parts, or fractions, of whole things.

Subtracting decimal numbers

Children are shown that we can also use column subtraction to subtract decimal numbers:

$$\begin{array}{r} 1\overset{2}{\cancel{3}}\cdot\overset{1}{5}\,2 \\ -\ \ 2\cdot 6\,0 \\ \hline 1\,0\cdot 9\,2 \end{array}$$

When subtracting decimals using column subtraction, ***keep the decimal points lined up.*** Keep all the digits on either side of the decimal point lined up in columns too. Then complete the calculation just like a normal column subtraction, borrowing if needed.

Subtracting money amounts with decimal numbers

Money amounts that have pounds and pence, like **£13.52**, are decimal numbers. We can subtract money amounts in exactly the same way as any other numbers with decimals:

$$\begin{array}{rr} & £\,1\,{}^{2}\!\not{3}\,.\,{}^{1}5\,2 \\ - & £\quad 2\,.\,6\,0 \\ \hline & £\,1\,0\,.\,9\,2 \end{array}$$

You can:

- *Encourage your child to try and add money amounts that include pounds and pence when they are shopping or budgeting.*
- *Print the digits and lines on pages 26–27, cut them out and use them, instead of pen and paper when trying column subtraction calculations with decimals and decimal money amounts.*

Converting money amounts

Usually, money amounts are shown as pence, for example **94p**, or as pounds and parts of pounds, for example **£3.67**.

In calculations with money amounts, all the amounts have to be shown in the same way. So, to calculate **£3.67 – 94p**, we can write both amounts as pence only:

367p – 94p

Or we can write both amounts as pounds and parts of pounds:

£3.67 – £0.94

To convert pence to pounds and pounds to pence can be quite straightforward; we just multiply or divide by 100. To change pounds to pence we multiply by 100:

£3.67 becomes 367p

To change pence to pounds we divide by 100.

94p becomes £0.94

You can:

- *Ask your child to convert the money amounts you see around you from pounds to pence or from pence to pounds.*

Negative numbers

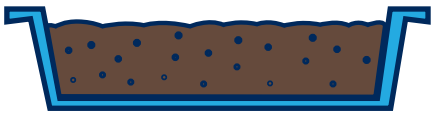
Eventually children will start to explore negative numbers. Negative numbers are not parts of things, or fractions of things. They are ***numbers less than zero*** – missing things or things that we owe. (Numbers above zero are called ***positive*** numbers.)

Children can find negative numbers easier to understand if they think of real-life examples:

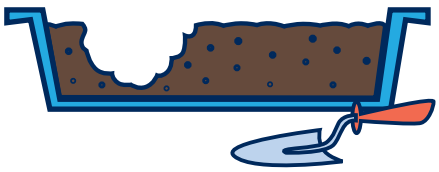
> **If I have no money *and* I owe you a pound, I have minus £1.00: £1.00 less than zero or nothing.**

Subtracting negative numbers

Children will be shown how to subtract negative numbers. Concrete examples can help. Look at this seed tray:



This blue seed tray has a smooth flat surface with no big mounds of soil and no big holes in the soil. We'll call that flat surface **zero**, or **0**. So, at the moment our soil is at **0**.



But if we want to plant a flower, we need to take out some soil to make room for it. We'll take out one scoop:

The soil in the blue seed tray isn't at **0** anymore. It's at one scoop less than **0**, it's ***minus*** one scoop, or just **⁻1**. If we want to plant another flower, we take out another scoop, like this:

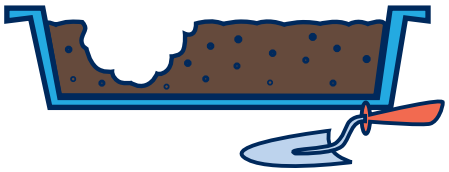
So now we've got two holes in the soil. The soil is now at **⁻2** scoops, or we can just say **⁻2**.

But what happens if we ***take away*** one of the holes? Perhaps we want to fill it up with soil again, or put our seedling in it. We have **$^{-}2$** and we're going to ***take away*** **1 hole, or $^{-}1$.** So the calculation is:

$^{-}2$ – $^{-}1$

two holes take away one hole

So, we'll take away one of the holes:



We've taken away one of the holes by filling it up with soil and now we only have one hole, or **$^{-}1$**, left. So:

$^{-}2$ – $^{-}1$ = $^{-}1$

two holes take away one hole equals one hole

The strange thing is that even though we did a take away calculation, we've now got ***more*** soil: it only has one hole, or **$^{-}1$**, instead of two holes, or **$^{-}2$**. Because what we were taking away was a hole, or something missing, our answer has gone up.

It can take children lots of time and practice to really understand how, and why, when you take away a negative number, the answer goes up, not down.

You can:

- *Use real things, e.g. soil in a seed tray or flower bed, thermometers, money boxes or bank accounts to explore negative and positive numbers with your child.*

Five little ducks

5 little ducks went swimming one day
Over the hill and far away.
Mummy Duck said, 'Quack, quack, quack, quack!'
But only 4 little ducks came back.

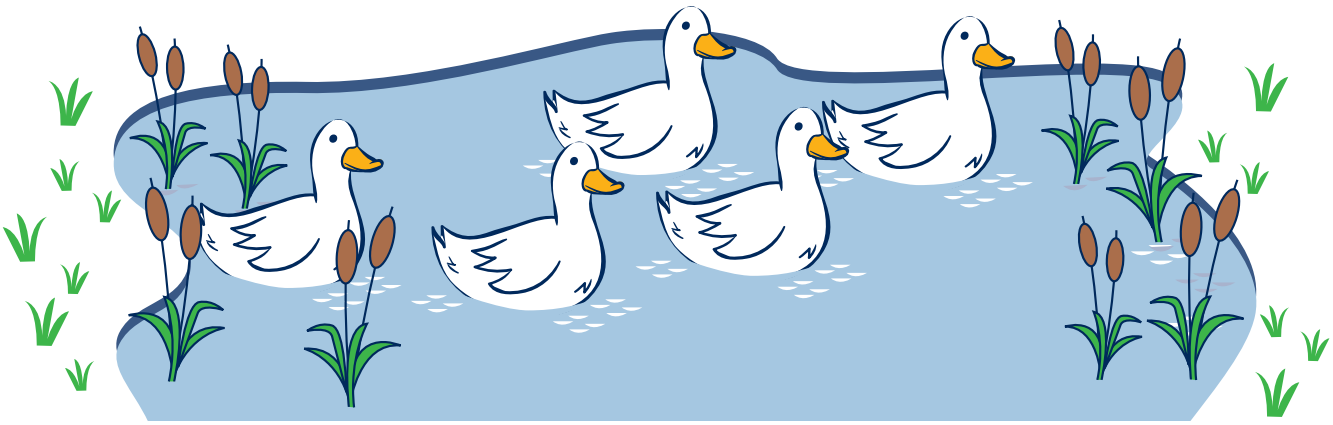
4 little ducks went swimming one day
Over the hill and far away.
Mummy Duck said, 'Quack, quack, quack, quack!'
But only 3 little ducks came back.

3 little ducks went swimming one day
Over the hill and far away.
Mummy Duck said, 'Quack, quack, quack, quack!'
But only 2 little ducks came back.

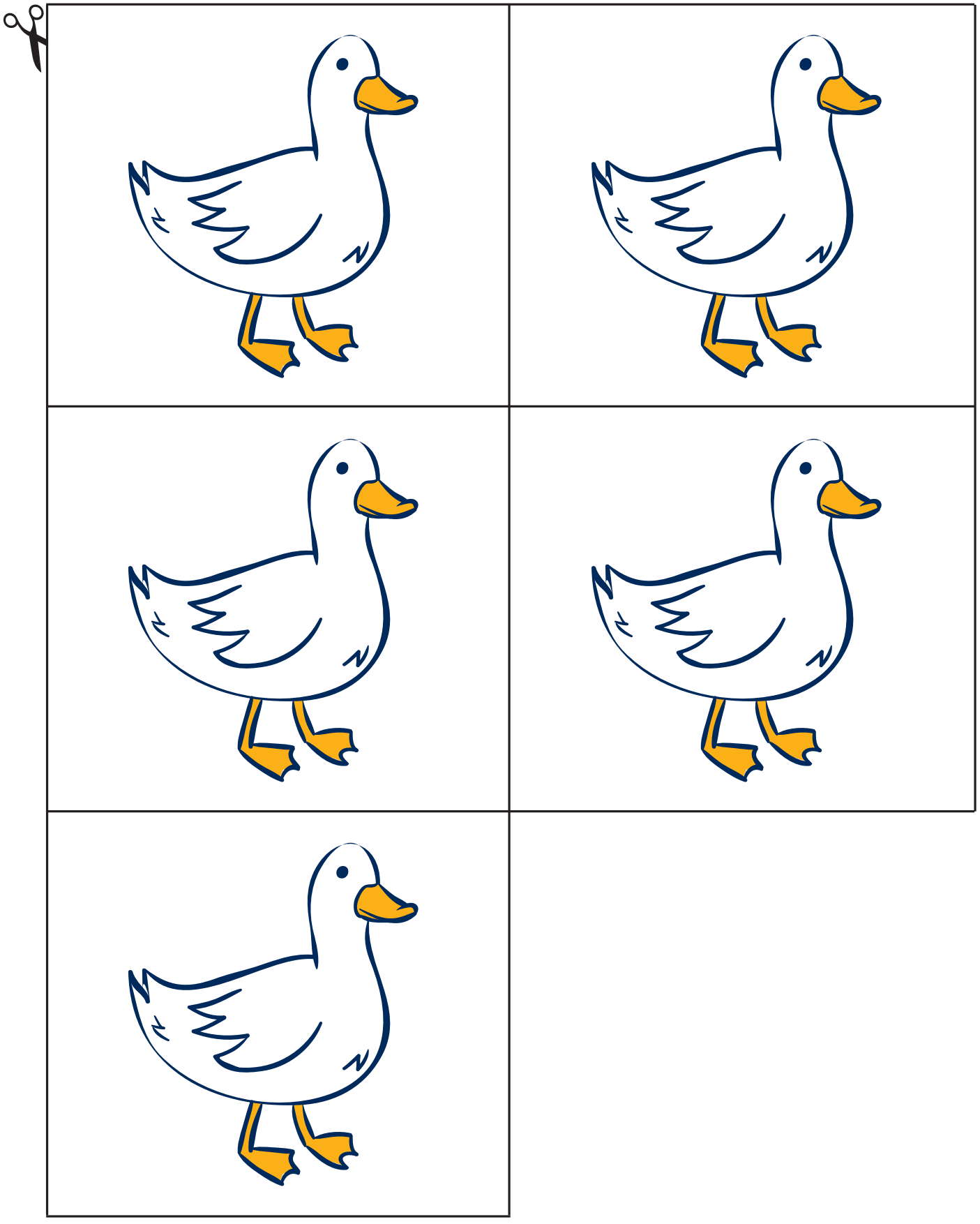
2 little ducks went swimming one day
Over the hill and far away.
Mummy Duck said, 'Quack, quack, quack, quack!'
But only 1 little duck came back.

1 little duck went swimming one day
Over the hill and far away.
Mummy Duck said, 'Quack, quack, quack, quack!'
But no little ducks came swimming back.

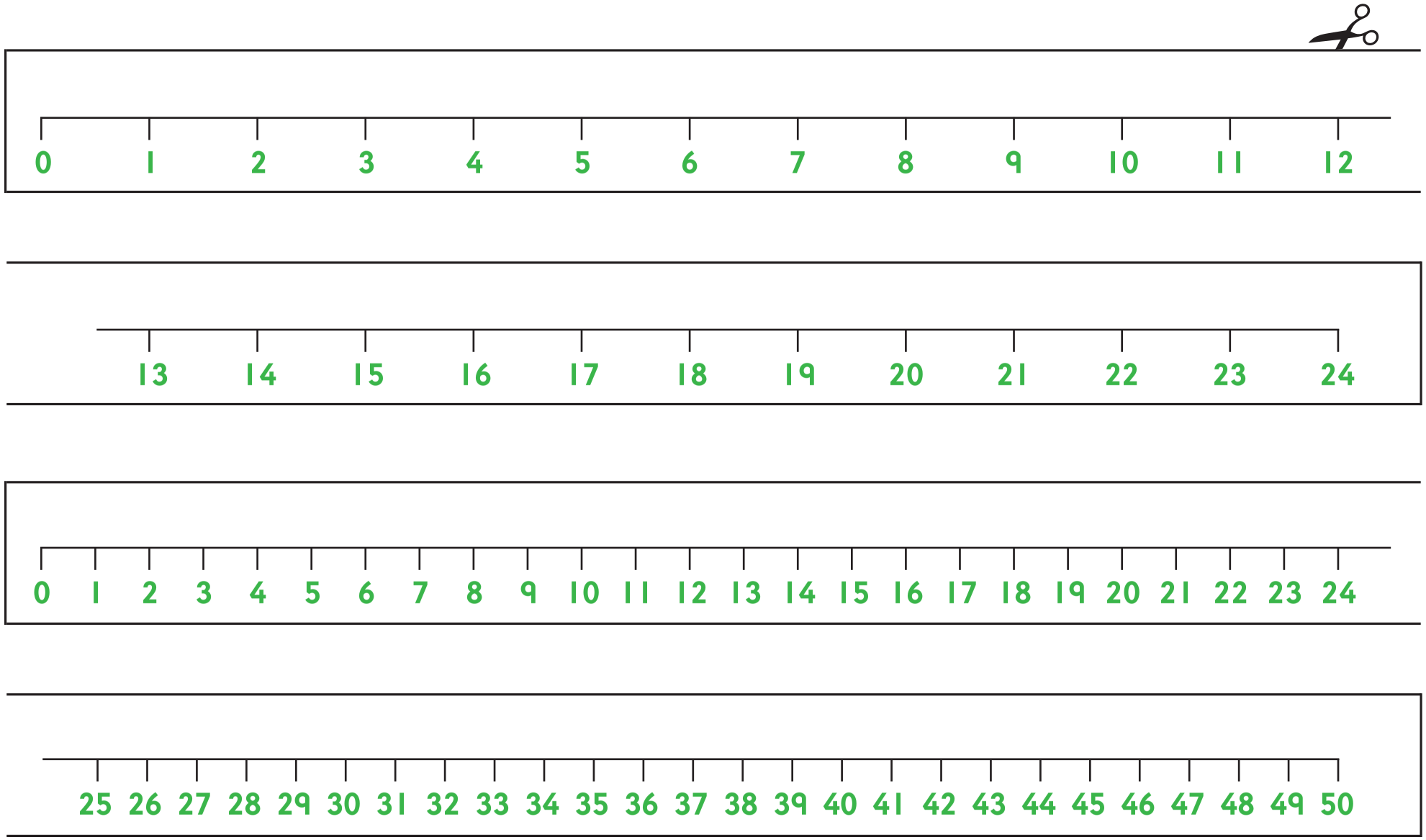
No little ducks went swimming one day
Over the hill and far away.
Mummy Duck said, 'Quack, quack, quack, quack!'
And all 5 ducks came swimming back.



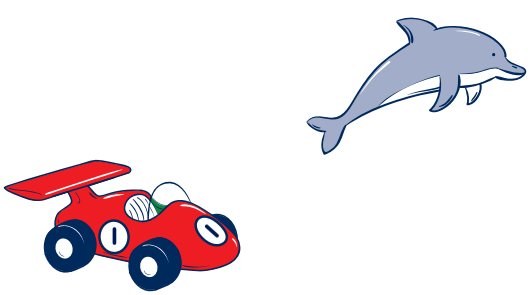
Cut out ducks



Number lines

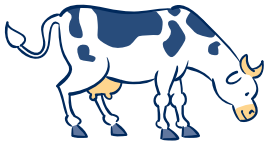
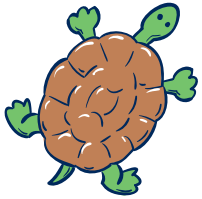


Number line counters



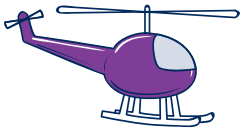









Digits cards and lines for column subtraction

0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5

Digits cards and lines for column subtraction (continued)

6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9
•	•	•	•	•

Subtraction Bingo! (2 – 4 players)

You will need:

Subtraction question cards (pages 29–30)

Subtraction Bingo cards, one per player (pages 31–34)

What to do:

Choose a bingo caller (can be one of the players). Give him or her the question cards face down in a pile.

Give all players a Bingo card.

The bingo caller turns over a Subtraction question card, holds it up and reads it out.

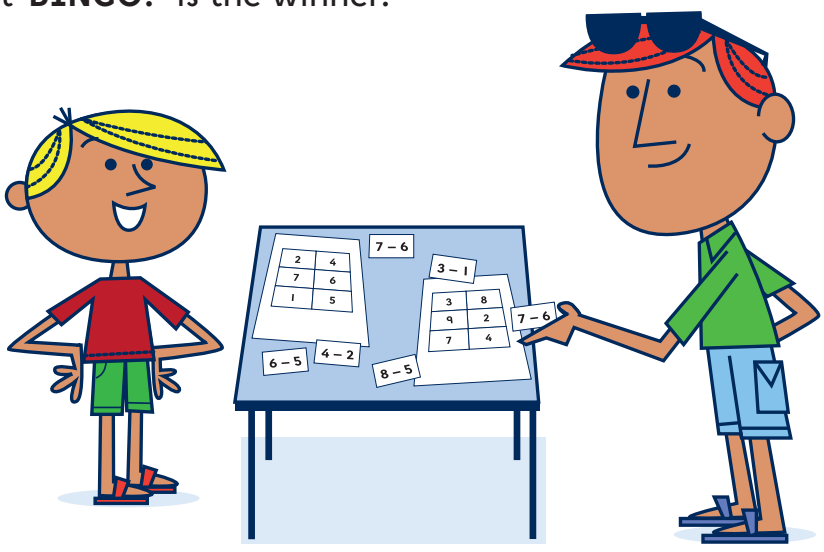
If a player has the answer to the question on their Bingo card, they must shout out 'Bananas!' or another agreed silly word before anyone else.

The player who shouts out 'Bananas!' first places the question card over the answer on their Bingo card.

If someone shouts 'Bananas!', but doesn't have the answer on their Bingo card, they must miss a turn.

If nobody has the answer on their card, discard it and pick another question card.

When all the spaces on a player's Bingo card are covered, they shout '**BINGO**!' The first person to shout '**BINGO!**' is the winner.



Subtraction question cards

10 – 1	10 – 2	10 – 3
10 – 4	10 – 5	10 – 6
10 – 7	10 – 8	10 – 9
9 – 1	9 – 2	9 – 3
9 – 4	9 – 5	9 – 6
9 – 7	9 – 8	8 – 1
8 – 2	8 – 3	8 – 4

Subtraction question cards (continued)

8 – 5	8 – 6	8 – 7
7 – 1	7 – 2	7 – 3
7 – 4	7 – 5	7 – 6
6 – 1	6 – 2	6 – 3
6 – 4	6 – 5	5 – 1
5 – 2	5 – 3	5 – 4
4 – 1	4 – 2	4 – 3
3 – 1	3 – 2	2 – 1

Subtraction Bingo card I

2	7
5	3
4	8

Subtraction Bingo card 2

4	7
9	5
2	6

Subtraction Bingo card 3

4	1
7	8
6	3

Subtraction Bingo card 4

2	4
6	1
5	3