

Counting in School

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Counting in School

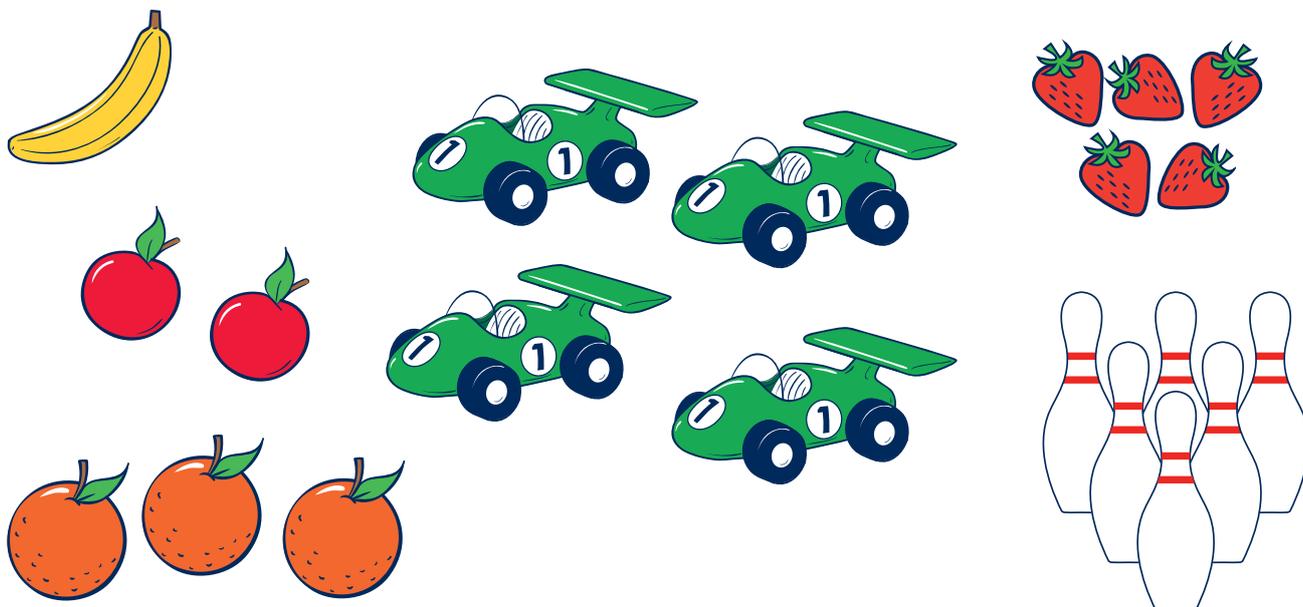
Introduction

Counting is one of the first maths skills that children develop at school. All their later maths skills build on this foundation. In this booklet, you'll find out how children are taught to count. 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 counting.

Counting in everyday life

Most of us use numbers every single day. Even before they start school, we can really help our children by showing them that numbers and counting are a part of real life, not just something they do at school with a teacher.

Real things, especially fun or enticing things, bring counting to life, keep children interested, and help them to learn using touch, sight, sound and even taste and smell.



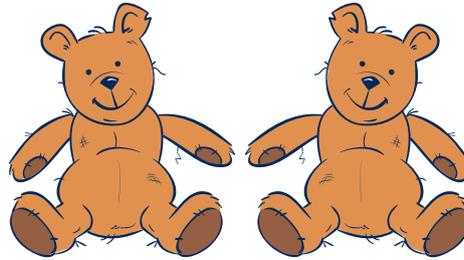
We can help them to count the things that are around us, and we can also discuss written numbers when we see them in our daily lives.

Amounts and their names

Children first learn that different amounts of things look different and have different names:



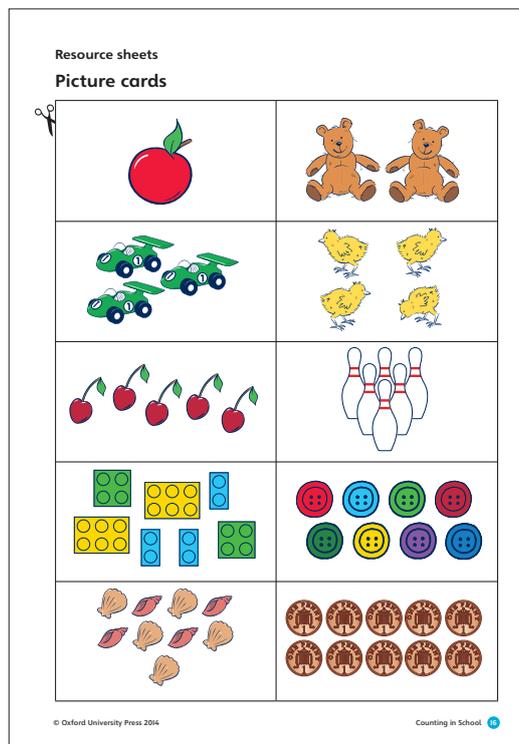
'one'



'two'

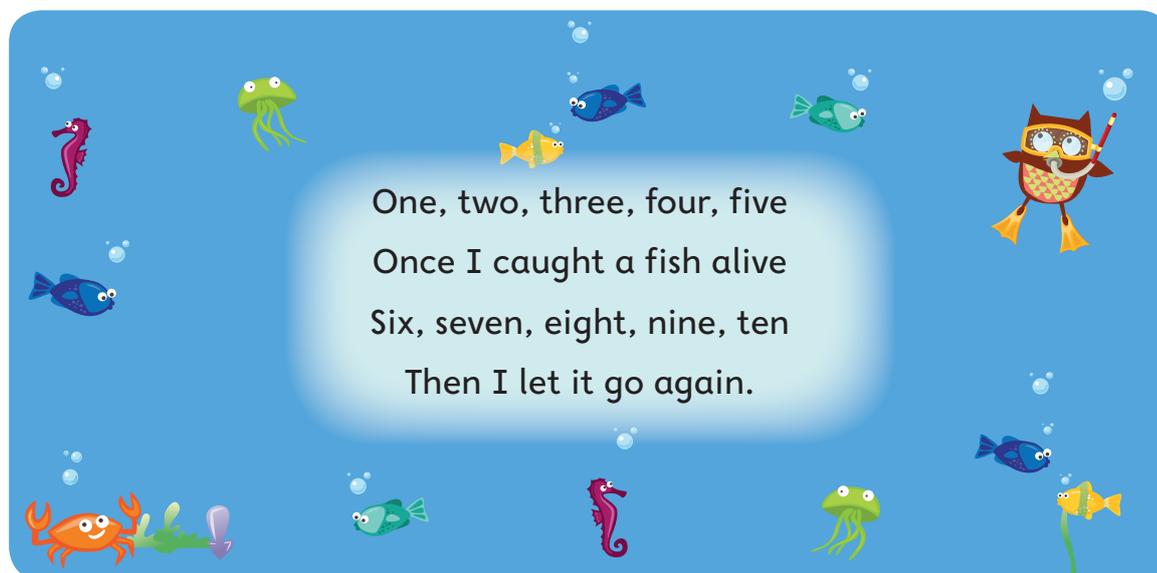
You can:

- Help your child to count familiar things, like fingers and toes, toys, food or things in picture books.
- Print the picture cards on page 16 and help your child to count the things in the pictures.
- Count actions together, such as jumps or footsteps. A game like 'What's the time, Mr Wolf?' can be great for this.
- Play games that include counting, like skittles, snakes and ladders or other games with counters to move after throwing dice.



Counting songs

Lots of children's nursery rhymes and songs are designed to help children count. Here's a favourite:

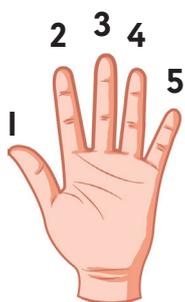


Using fingers or other props

Learning that each hand has five fingers is very useful for counting, adding and subtracting. Using toys or pictures to count whilst singing number songs can bring the song, and the counting, to life.

You can:

- Use fingers as counters when singing number songs.



One, two, three, four, five
Once I caught a fish alive...

- Use objects or pictures, say fish for fish songs, ducks for duck songs, etc.
- Print off the ten digit cards on page 17 and point to each digit as you sing it.

Symbols for numbers

Amounts, their spoken names and their symbols are three different types of knowledge that children generally develop in steps.



When our children have become familiar with the spoken names for different small amounts, they can start to learn that each number also has a written symbol, called a numeral:



You can:

- Cut out the picture and numeral cards on pages 16 and 17. With your child, match up each numeral card with the card that shows the same amount of things. When your child is ready, use the cards to play matching games like Pairs or Snap.
- Help your child to make their own set of matching numeral and picture cards.
- Point out single-digit numbers when you see them around – on doors, cars, recipes, food packages, etc. – and see if your child can say the name and hold up the right number of fingers.

Writing numerals

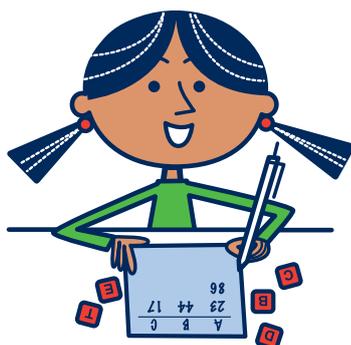
Lots of children find that remembering how to write numerals and letters, and getting them the right way round, takes a long time. These difficulties, on their own, do not mean that a child has dyslexia or dyscalculia, as some people fear. There are some fun games and activities that can help.

You can:

- *Make digits out of modelling dough, salt dough, clay or card. Handling 3D digits can be a great help in remembering their shape.*

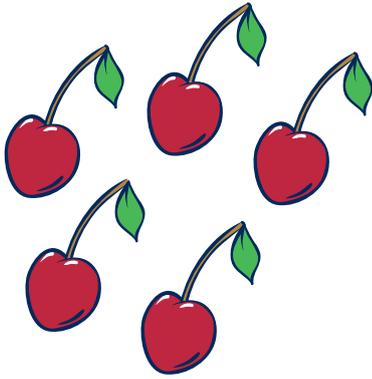


- *Help your child to draw digits on sand, sandpaper or other textured surfaces.*
- *Draw big bubble digits together on paper or card. Fill them in with a line of glue and then cover with glitter, sequins, sand, lentils or something else with a rough, interesting feel. As your child traces over these shapes with their finger, the sensations in their finger will give their memory a boost.*
- *Find opportunities for your child to write numbers, such as helping with shopping lists, birthday cards and keeping scores in games.*

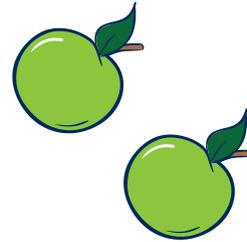


Ordering amounts and numbers

As children learn to count they also learn whether a number, or amount, is more or less than another number or amount:



is more than



and

5

is more than

2

Ask questions that help children to compare the sizes of numbers and amounts. Encourage them to use phrases like 'more than' and 'less than':

'Who has more potatoes?'

**'You have 3 cars and Grace has 2 cars.
Who has more cars?'**

**'This sweet costs 5p and this sweet costs
10p. Which sweet costs more?'**

Place value

In lower primary years children will focus on using numbers up to 100. Then they will gradually start using bigger numbers, working with up to 6-digit numbers and beyond. Comparing large numbers can be confusing. Look at these:

4

32

99

1001

9 is bigger than 1. Does this mean that 99 is bigger than 1001?

To be able to order bigger numbers, children need to understand place value. Place value simply means the value given to a digit according to where it's placed in a number.

Look at this place value chart. It shows how the value of the digit 2 changes when its position changes in a number:

Thousands × 1000	Hundreds × 100	Tens × 10	Units × 1
			2
		2	0
	2	0	0
2	0	0	0

2 in the units column = 2 single units: 2

2 in the tens column = 2 lots of ten: 20

2 in the hundreds column = 2 lots of a hundred: 200

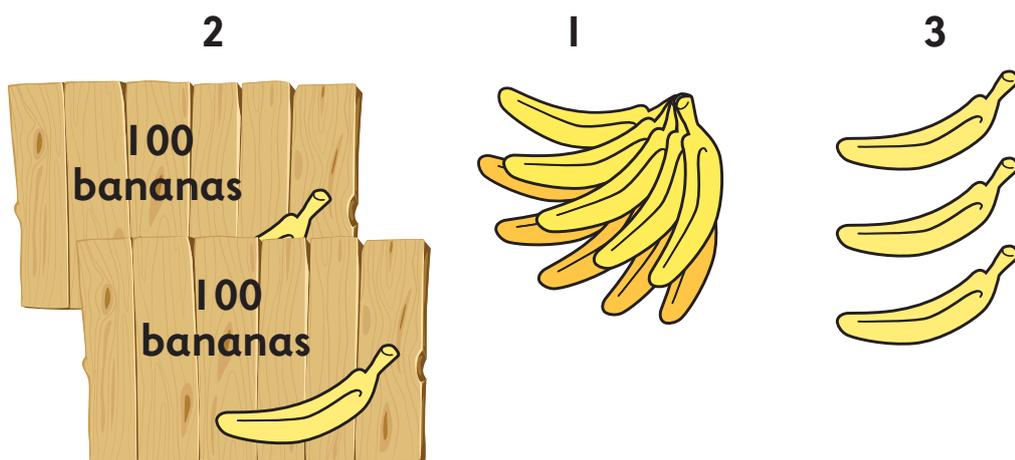
2 in the thousands column = 2 lots of a thousand: 2000

With each move to the left, the value of the digit 2 gets 10 times bigger.

Using objects and pictures to understand place value

Objects or pictures can make place value easier to understand.

Here the boxes of bananas represent the hundreds, the bunches represent tens and the single bananas represent units:



So, altogether we have:

213

bananas

You can:

- Use small objects that you can get about 100 of, e.g. drinking straws, play bricks or dried spaghetti. Leave 9 single and make some bundles or piles of 10. Choose a number of bundles and a number of singles. Can your child write down the number you have selected?
- Print and cut out the pictures of boxes, bunches and single bananas on page 18. Play with these with your child, matching written numbers to the right amounts of bananas.

Place value in very large numbers

Children work towards using numbers with as many as eight digits, like 10 000 000 (ten million). Remembering the value of each place in numbers this size can take time. Charts like the one below can help.

Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-thousands	Thousands	Hundreds	Tens	Ones

It can also be helpful for children to see that the values of the different digits in a number come in groups of three:

- The three digits on the far right (blue) always have a value in the hundreds or less – they're single units, tens or hundreds.
- The next three (red) always have a value in the thousands – single thousands, ten thousands or hundred thousands.
- The next three (green) are always in the millions – single millions, ten millions and hundred millions.

You can:

- *Print the Place Value Chart on page 19 and the Digit cards on page 20. Cut out the digits and then play around with them with your child, saying numbers and matching them by placing the digits on the chart. For example, for the number 6031 we would have the digit 6 in the thousands column, the digit 0 in the hundreds column, the digit 3 in the tens column and the digit 1 in the units column.*

Counting decimal numbers

Later in primary school, children will learn how to use and count decimal numbers.

decimal point

24 ↓ • 13 is a decimal number.

It contains a decimal point. Any digits before the decimal point (those in purple) are whole numbers that represent whole things. But any digits after the decimal point (those in blue) represent parts, or fractions, of whole things. Look at this place value chart that includes decimals:

The chart shows the relationship between place values. Above the chart, arrows labeled '× 10' point from right to left between columns: Units to Tens, Tens to Hundreds, Hundreds to Thousands, Tenth to Hundredth, and Hundredth to Tenth. Below the chart, arrows labeled '÷ 10' point from left to right between columns: Thousands to Hundreds, Hundreds to Tens, Tens to Units, Units to Tenth, and Tenth to Hundredth.

Thousands 1000	Hundreds 100	Tens 10	Units 1	Tenths $\frac{1}{10}$	Hundredths $\frac{1}{100}$
			0	0	1
			0	1	
			1		
		1	0		
	1	0	0		
1	0	0	0		

We've seen that when a digit is moved a place to the left we multiply it by 10 – one ten becomes one hundred and so on.

So, when a digit is moved one place to the right, we **divide** it by 10. One in the tens column is worth one lot of ten, which is 10. Move it one place to the right, to the units column, and it's worth 10 **divided** by 10, which is one single unit, or just 1.

Now, if we move it one more place to the right, just past the decimal point, it's now worth 1 single unit **divided** by 10, and that's $\frac{1}{10}$ of a single unit – 1 part of a single unit, or thing, that's been split into 10 equal parts.

Any digit in this column is worth a number of tenths – a 3 in this column, as in 0.3, is worth $\frac{3}{10}$.

The pattern goes on. If we move our 1 to the right again, it represents $\frac{1}{10}$ of a unit divided by 10 again – and that's $\frac{1}{100}$ of a single unit – 1 part of a single thing, or unit, that's been split into one hundred equal parts.

A different digit here would also represent a number of hundredths. A 7, as in **0·07**, is 7 hundredths of a whole thing.

Naming and valuing decimal numbers

When we say a decimal number, we normally just list the digits that come after the decimal point one after another. So 0·37 would be said as 'zero point three seven' and 15·37 would be said as 'fifteen point three seven'.

But how do we explain how much a decimal is worth? We have seen that 0·3 is worth $\frac{3}{10}$ and that 0·07 is worth $\frac{7}{100}$.

But what about 0·37?

We could say it's worth $\frac{3}{10}$ and $\frac{7}{100}$.

$\frac{3}{10}$ is the same as $\frac{30}{100}$.

Altogether $\frac{30}{100}$ and $\frac{7}{100}$ come to $\frac{37}{100}$, so that is how we describe it: $\frac{37}{100}$

Here are some other examples:

0·45 is worth $\frac{45}{100}$ (forty-five hundredths)

3·59 is worth $\frac{359}{100}$ (three hundred and fifth-nine hundredths)

0·567 is worth $\frac{567}{1000}$ (five hundred and sixty-seven thousandths)

You can:

- *Print off the Decimal place value chart on page 21 and use the digit cards from page 20.*
- *Can your child place the digits in the chart for a decimal number that you name, or identify a decimal number that you have built on the chart?*
- *Can your child describe the number of tenths or hundredths in a decimal number that you have built?*

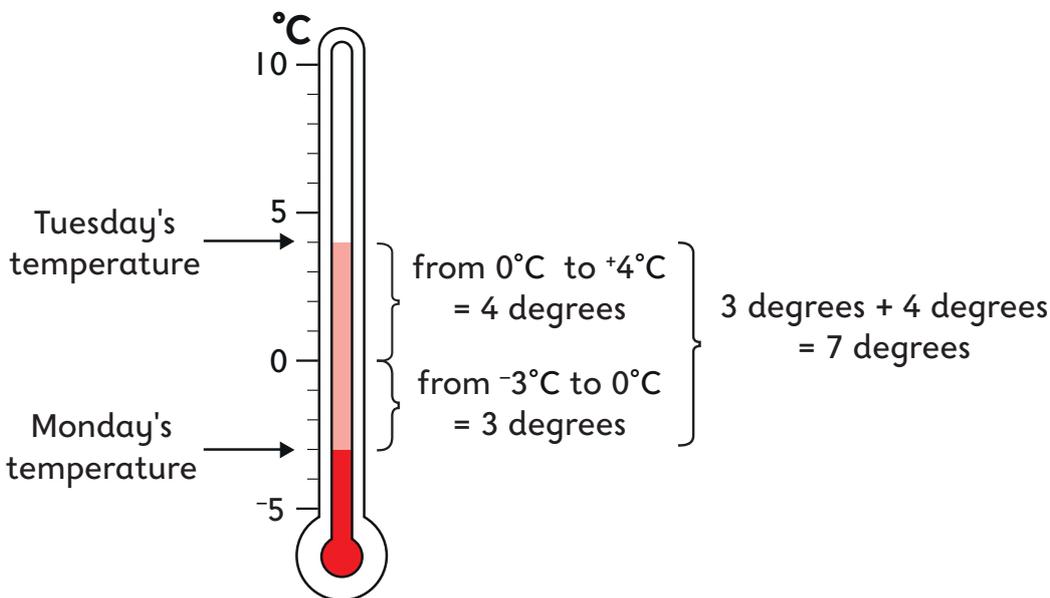
Negative numbers

As well as decimals, children will start to explore negative numbers. Negative numbers are different from decimals or fractions – they're not *parts* of things, but *missing* things or things that we owe. 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. We can write this as $-£1$.

Some children can find it hard to grasp that, with negative numbers, the higher the digit the lower the worth of the number. So -5 is a *lower* temperature than -3 .

Finding the difference between negative and positive numbers

To find the difference between a negative number and a positive number, children need to count from the negative number to zero, then from zero to the positive number, and then add together the two results. Look at this thermometer:



On Monday it was -3°C . On Tuesday it was $+4^{\circ}\text{C}$ (we can just say 4°C). To find the difference in temperature between the two days:

- First count how many degrees there are from -3°C to 0°C : there are 3.
- Then count how many degrees there are from 0°C to 4°C degrees: there are 4.
- Finally add together those two amounts: $3 + 4 = 7$.

So the total difference in temperature was **7 degrees**.

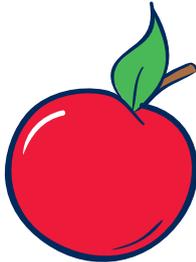
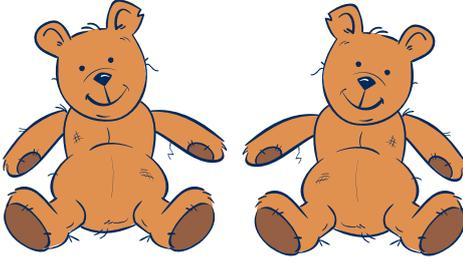
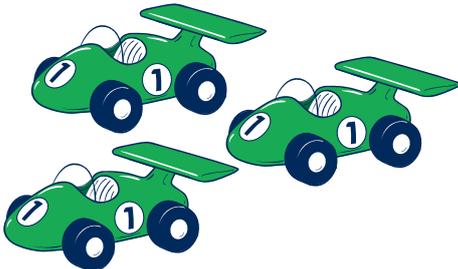
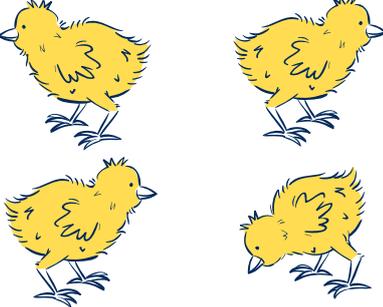
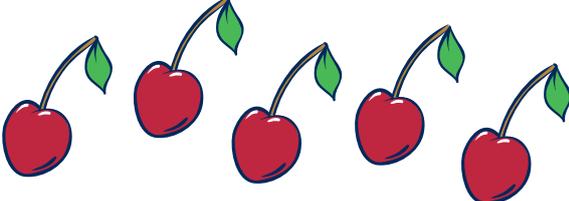
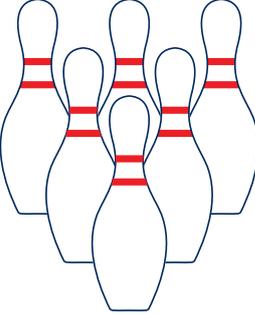
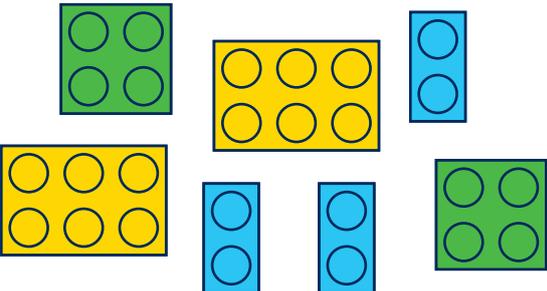
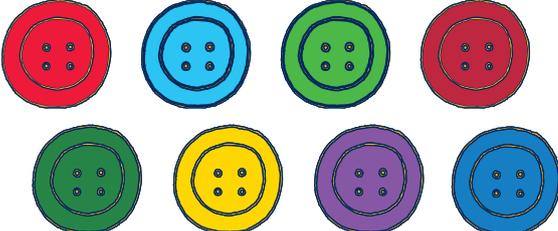
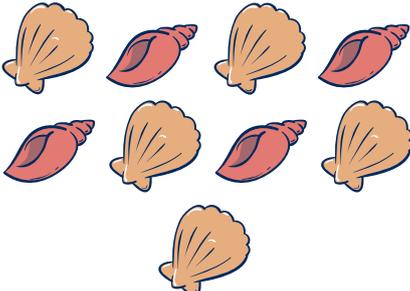
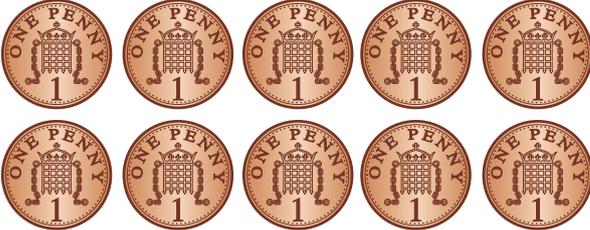
You can:

- *Print off the thermometers on page 22. Shade in the temperature gauges on two of them to different temperatures. Help your child to work out which temperature is higher and which is lower.*
- *Shade in the gauges on two of the thermometers to different temperatures. Help your child to work out what the difference in temperature is.*

When our children are using big numbers, decimal numbers or negative numbers in school, it helps if we're looking at them at home too – money with pounds and pence, numbers on factual TV programmes, weather forecasts, the cost of cars, homes and so on.

Any opportunity to chat about the numbers we see around us will add to our children's ability to use and count numbers in all parts of their daily lives.

Picture cards

Numeral Cards



1	2
3	4
5	6
7	8
9	10

Place value banana cards

A 6x3 grid of banana cards. The top two rows each contain three cards with the text "100 bananas" and an illustration of a bunch of 100 bananas. The bottom four rows each contain three individual banana cards. A pair of scissors icon is located on the left side of the top row, indicating where to cut out the cards.

Place Value Chart

	Hundred millions
	Ten millions
	Millions
	Hundred thousands
	Ten thousands
	Thousands
	Hundreds
	Tens
	Ones

Place Value Chart

	Hundred millions	
	Ten millions	
	Millions	
	Hundred thousands	
	Ten thousands	
	Thousands	
	Hundreds	
	Tens	
	Ones	
●	Tenths	$\frac{\quad}{10} -$
	Hundredths	$\frac{\quad}{100} -$
	Thousandths	$\frac{\quad}{1000} -$

Thermometers

