

Maths Mastery

Counting in powers of 10



Counting in 10s

Nura counts forwards and backwards in 10s from 29. Which numbers could Nura count as she does this?

3579	8923	-29	-201
10 899	307 819	270 009	999 999
58 991	-999	3972	-29 831

Write three more numbers she would count.

Counting in 100s

Count forwards in hundreds from these numbers.
What are the second and fifth numbers that you arrive at?

289
891
19 034
99 607
610 729

Now try backwards.

What are the second and fifth numbers to which you arrive?

Try this with some numbers of your own maybe starting with a negative number.

Counting in 1000s

George counts forwards from 34 819 in thousands.

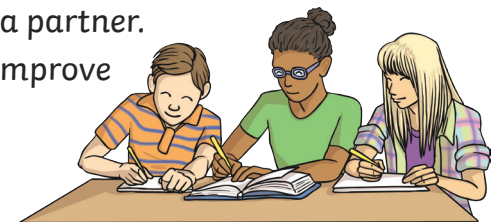
Write some numbers that George might say as he counts.

Explain which digits will change and which will not change and why this happens.

What about if George counts backwards?

Share your explanations with a partner.

Is there anything you can improve in your own explanation?



Counting in 10 000s

Keziah counts forwards in ten thousands. Write the next three numbers from these:

45 901

193 619

10 720

287 718

519 374

Which sequence would become negative after counting backwards three times in 10 000s?

Give a partner some numbers to count forwards and backwards from in 10 000s.

Counting in 100 000s

Ruben counts forwards in hundred thousands. How many times will he count from these numbers to pass one million?

249 001

482 904

717 566

572 599

833 224

Try some numbers of your own. Is there a pattern?

Maths Mastery

Counting in powers of 10

Answers



Counting in 10s Answers

Nura counts forwards and backwards in 10s from 29. Which numbers could Nura count as she does this?

3579	8923	-29	-201
10 899	307 819	270 009	999 999
58 991	-999	3972	-29 831

Write three more numbers she would count.

Any positive number ending in 9 or negative number ending in 1.

Counting in 100s Answers

Count forwards in hundreds from these numbers. What are the second and fifth numbers that you arrive at?

Number	Second	Fifth	Second (Backwards)	Fifth (Backwards)
289	489	789	89	-211
891	1091	1391	691	391
19 034	19 234	19 534	18 834	18 534
99 607	99 807	100 107	99 407	99 107
610 729	610 929	611 229	610 529	610 229

Try this with some numbers of your own, maybe starting with a negative number.

Counting in 1000s Answers

Any number ending 819.

Counting in thousands from 34 819:

- The hundreds, tens and ones will stay as 819.
- The whole number of thousands can be any number (e.g. there are 34 thousands in 34 819) so the thousands, ten thousands, hundred thousands etc. can be any number.

Counting backwards the hundreds, tens and ones will change to 181 when negative.



Counting in 10 000s Answers

Keziah counts forwards in ten thousands. Write the next three numbers from these:

Number	1st	2nd	3rd
45 901	55 901	65 901	75 901
193 619	203 619	213 619	223 619
10 720	20 720	30 720	40 720
287 718	297 718	307 718	317 718
519 374	529 374	539 374	549 374

Give a partner some numbers to count forwards and backwards from in 10 000s.

10 720 will become negative on the second count backwards.

Counting 100 000s Answers

Ruben counts forwards in hundred thousands. How many times will he count from these numbers to pass one million?

Number	Counts
249 001	8
482 904	6
717 566	3
572 599	5
833 224	2

Try some numbers of your own. Is there a pattern?

Maths Mastery

Negative Numbers

Maths Mastery

Counting Negatively

Work with a partner. Challenge your partner by asking them to count by giving:

Starting number

Step

Direction

e.g. Count in 2's, from 5, backwards:

5, 3, 1, -1, -3, -5, -7.....

A good challenge is one where your partner gets most correct, but may need to really think.

Maths Mastery

True or False

Seven less than four is minus three.

$$-7 + 12 = -19$$

16 more than -4 is -12

The temperature is -70°C outside and 170°C inside. The difference is 100°C .

Create your own similar questions for a partner.

Maths Mastery

Order it

Order the following numbers from smallest to largest:

1. 34, -23, 14, -12, 41, -2, -24, 13
2. 90°C , -70°C , -90°C , 30°C , -50°C , 00°C , -120°C
3. 45, 67, -23, 28, -12, 78, -59, -1

Write some positive and negative numbers for a partner to order.

Maths Mastery

Negative Numbers

Answers

Maths Mastery Answers

Counting Negatively

Work with a partner. Challenge your partner by asking them to count by giving:

Starting number

Step

Direction

e.g. Count in 2's, from 5, backwards:

5, 3, 1, -1, -3, -5, -7.....

A good challenge is one where your partner gets most correct, but may need to really think.

Maths Mastery Answers

True or False

Giving reasons, explain whether the following are true or false:

True

False - the answer is 5. The answer goes through 0, so +7 to 0, and +5 more to 5.

False - the answer is 12. The answer goes through 0, so +4 to 0, and +12 more to 12.

False - the answer is 24°C. The answer goes through 0, so -7 to 0 is 7, and 0 to 17 is 17. $7 + 17 = 24$.

Create your own similar questions for a partner.

Maths Mastery Answers

Order it

Order the following numbers from smallest to largest:

1. **-24, -23, -12, -2, 13, 14, 34, 41**

2. **120°C, -90°C, -70°C, -50°C, 00°C, 30°C, 90°C**

3. **-59, -23, -12, -1, 28, 45, 67, 78**

Write some positive and negative numbers for a partner to order.

Maths Mastery

Place Value Number Problems

Place Value Number Problems

87 000

It is _____ less than 90 000.

It is _____ less than 100 000.

It is made of _____ thousands.

It is made of _____ hundreds.

Place Value Number Problems

87 000

Count backwards in ten thousands. Write the 6th, 7th and 8th numbers to which you come.

What would happen if you wrote the number with Roman Numerals?

Write a similar set of questions for a partner.

Place Value Number Problems

What's the Temperature?

Day	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Temp °C	-4	3	-2	-1	8	6	0

Here is a table showing the temperature each morning for a week.

When was the coldest morning?

When was the warmest morning?

Which morning saw the largest change in temperature from the previous morning?

What's the Temperature?

Day	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Temp °C	-4	3	-2	-1	8	6	0

Here is a table showing the temperature each morning for a week.

Place the temperatures in order from lowest to highest?

Create your own table of temperatures and write some questions for a partner.

The Population

England	53 012 456	
Wales	3 063 456	
Scotland	5 295 000	
Northern Ireland	1 810 863	
United Kingdom	63 181 775	

The population of the UK in 2011 was:

1. Round each total to nearest one million.
2. Round the population of Wales and Northern Ireland to the nearest 100 000. What is the difference?

293 293

Write the number in words.

It is _____ less than 300 000.

It is _____ less than 1 000 000.

It is made of _____ ten thousands and _____.

It is made of _____ thousands and _____.

Count forwards in hundred thousands. Write the 7th and 8th numbers to which you come.

Using another 6 digit number, write some questions for a partner.

Maths Mastery

Place Value Number Problems

Answers

Place Value Number Problems Answers

87 000

It is 3000 less than 90 000.

It is 13 000 less than 100 000.

It is made of 3000 thousands.

It is made of 3000 hundreds.

Place Value Number Problems Answers

87 000

Count backwards in ten thousands. Write the 6th, 7th and 8th numbers to which you come.

27 000, 17 000, 7 000

What would happen if you wrote the number with Roman Numerals?

LXXXVMM

Write a similar set of questions for a partner.

Place Value Number Problems Answers

What's the Temperature?

Day	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Temp °C	-4	3	-2	-1	8	6	0

Here is a table showing the temperature each morning for a week.

When was the coldest morning? **Monday**

When was the warmest morning? **Friday**

Which morning saw the largest change in temperature from the previous morning? **Friday**

What's the Temperature?

Day	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Temp °C	-4	3	-2	-1	8	6	0

Here is a table showing the temperature each morning for a week.

Place the temperatures in order from lowest to highest?

4, -2, -1, 0, 3, 6, 8

Create your own table of temperatures and write some questions for a partner.

The Population

England	53 012 456	53 000 000
Wales	3 063 456	3 000 000
Scotland	5 295 000	5 000 000
Northern Ireland	1 810 863	2 000 000
United Kingdom	63 181 775	63 000 000

The population of the UK in 2011 was:

1. Round each total to nearest one million. **3 100 000 – 1 800 000 = 1 300 000**
2. Round the population of Wales and Northern Ireland to the nearest 100 000. What is the difference?

293 293

Write the number in words.

**Two hundred and ninety three thousand,
two hundred and ninety three.**

It is 6707 less than 300 000.

It is 706 707 less than 1 000 000.

It is made of 29 ten thousands and 3293.

It is made of 293 thousands and 293.

Count forwards in hundred thousands. Write the 7th and 8th numbers to which you come. **993 293, 1 093 293**

Maths Mastery

Read, Write, Order and Compare Numbers up to 1 000 000

Read, Write, Order and Compare Numbers up to 1 000 000

Read

Work with a partner:

1. One partner writes down a six-digit number.
2. The other reads the number.
3. If they read it correctly, they write a number for the first partner.

Include some zeros to challenge.

Read, Write, Order and Compare Numbers up to 1 000 000

Write

Work with a partner:

1. One partner writes down a hidden six-digit number and reads it for the other.
2. The other partner writes it down. Check the numbers match.
3. If they are the same, swap roles.
4. If incorrect, check it has been read correctly.

Read, Write, Order and Compare Numbers up to 1 000 000

Order

	122112	211112	212112	221111		
111112	112121	121121	122121	211121	212121	221112
111121	112122	121122	122122	211122	212122	221121
111122	112211	121211	122211	211211	212211	221121
111211	112212	121212	122212	211212	212211	221122
111221	112221	121221	122221	211221	212212	221211
111222	112222	121222	122222	211222	212221	221212
112111	121111	122111	211111	212111	212222	221221
221222	222111	222112	222111	222112	222121	222122
222211	222212	222221	222222	111111	112112	121112

Compare

1. Work with a partner:
2. Choose six digit cards each.
3. Both partners write and hide a six-digit number using the six digits.
4. Toss a coin – heads is higher, tails lower.
5. Compare the numbers – who has the higher or lower number?
6. Remember to keep the score.

Value

Here is a 6-digit number:

123 456

Write down the numbers that are:

1. one thousand more
2. ten less
3. one hundred less
4. a hundred thousand more
5. twenty thousand less
6. nine more

With a calculation, how can you reverse the last:

- three digits
- four digits
- five digits
- six digits

Maths Mastery

Place Value Number Problems

Answers

Place Value Number Problems Answers

Value

Here is a 6-digit number:

123 456

Write down the numbers that are:

1. **214 456**
2. **123 446**
3. **123 356**
4. **223 456**
5. **103 456**
6. **123 456**

With a calculation, how can you reverse the last:

- | | |
|--------------|-----------------|
| three digits | +198 |
| four digits | +3087 |
| five digits | +41 976 |
| six digits | +530 865 |

Maths Mastery

Roman Calculations

Roman Calculations

Convert to Roman Numerals Practice

Convert these numbers to Roman Numerals.

14	27	46
87	138	267
501	762	1 058

Write five numbers, up to 4999, for a partner to convert.

Roman Calculations

Convert to Roman Numerals Practice

Convert these Roman Numerals to numbers.

III	XIX	XLIV
LXXII	XCVIII	CCLXX
DCCCLXXXVIII	MLV	

Write five Roman Numerals for a partner to convert.

Roman Calculations

Years in Roman Numerals

Complete this table:

467 BC	
	DCCC
1066 AD	
	MCCXV
1665 AD	
1987 AD	
	MMXVI

Write famous landmark years in history for a partner to convert.

Years in Roman Numerals

Place these dates in order.

424 AD

2016 AD

965 AD

2005 AD

CMXXXVII

DLXIII

MMXI

MII

CMLXXXV

824 AD

Can you place your birth year on the date line? Compare with a partner.

Roman Addition

Calculate these without converting to numbers.

e.g. XXXVI + XXIII = XXXXXVIII = LIX

LXXVI + XLIII =

CCIX + CLXXVI =

CCCLXXVII + CCXXIV =

DCCLXVIII + CCLXXXII =

DCXXIX + DLXXXII =

MCCLXXIV + DCCXXXII =

Write some of your own roman numeral calculations for a partner.

Roman Subtraction

Calculate these without converting to numbers.

e.g. XXXVI - XXIII = XV - II = XIII

LXXVI - XLIII =

CCXI - CLXXVI =

CCCLXXVII - CCXXIV =

DCCLXVIII - CCLXXXII =

DCXXIX - DLXXXII =

MCCLXXIV - DCCXXXII =

Write some of your own for a partner.

Roman Multiplication

Calculate these without converting to numbers.

e.g. XXXVI × III = XXXXXXXXXVVVIII = CVIII

LXXVI × II =

CCXI × IV =

CCCLXXVII × III =

DCCLXVIII × V =

DCXXIX × VI =

MCCLXXIV × III =

Write some of your own for a partner.

Maths Mastery

Roman Calculations

Answers

Roman Calculations Answers

Convert to Roman Numerals Practice

Convert these numbers to Roman Numerals.

XIV

XXVII

XLVI

LXXXVII

CXXXVIII

CCLXVII

DI

DCCLXII

MLVII

Write five numbers, up to 4999, for a partner to convert.

Roman Calculations Answers

Convert to Roman Numerals Practice

Convert these Roman Numerals to numbers.

3

19

44

72

98

270

888

1055

Write five Roman Numerals for a partner to convert.

Roman Calculations Answers

Years in Roman Numerals

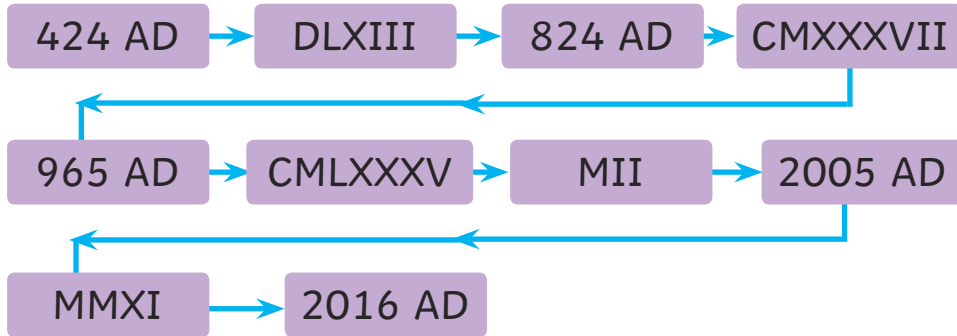
Complete this table:

467 BC	CDLXVII
802 AD	DCCC
1066 AD	MLXVI
1215 AD	MCCXV
1665 AD	MDCLXV
1987 AD	MCMLXXXVII
2016 AD	MMXVI

Write famous landmark years in history for a partner to convert.

Years in Roman Numerals

Place these dates in order.



Can you place your birth year on the date line? Compare with a partner.

Roman Addition

Calculate these without converting to numbers.

e.g. XXXVI + XXIII = XXXXXVIII = LIX

LXXVI + XLIII = **CXIX**

CCIX + CLXXVI = **CCCLXXXV**

CCCLXXVII + CCXXIV = **CCCCCLXXXVVI = DCI**

DCCLXVIII + CCLXXXII = **DCCCCLXXXVIII = ML**

DCXXIX + DLXXXII = **DDCLXXXXI = MCCXI**

MCCLXXIV + DCCXXXII = **MDCCCXXXVII = MMVI**

Write some of your own roman numeral calculations for a partner.

Roman Subtraction

~~LXXVI~~ - ~~XLIII~~ = XXXIII

~~CCIX~~ - ~~CLXXVII~~ = XXXIII

~~CCCLXXVIII~~ - ~~CCXXIV~~ = CLIII

~~DCCLXVIII~~ - ~~CCLXXXII~~ = CDLXXXVI

~~DCXXIX~~ - ~~DLXXXIII~~ = XLVII

~~MCCLXXIV~~ - ~~DCCXXXIII~~ = DXLII

Roman Multiplication

LXXVI × II = **LL XXXXVV II = CLII**

CCIX × IV = **CCCC CCC IIIIX XXX = DCCCXXXVI**

CCCLXXVII × III = **CCCCCCCCCLL LXXXXX XVV VIII I = MCXXXI**

DCCLXVIII × V = **DD DD DCCCC CCCC LL LL LXXXXX VV VV VIII IIIIIIIII = MMMDCCCXL**

DCXXIX × VI = **DD DD DD CCCCC C XXXXXXXXXXX XXXX XX IIIIIIX = MMMDCLXXIV**

MCCLXXIV × III = **MMM CCCCC C LL LXXXXX X VV IIIV = MMMDCCCXXII**

Maths Mastery

Rounding to the powers of 10

Rounding to the powers of 10

Work with a partner.

Write a number (up to 6 digits) on a small whiteboard (hidden).

Say the number to your partner who must round it to the nearest 10. If they get the answer correct, then it is their turn to write a number.

If your partner guesses an incorrect answer, then you will get a point.

Play to 10 points and then swap partners.

If your partner is finding it difficult, perhaps show them the numbers for a few seconds.

Rounding to the powers of 100

For each of these numbers, write five numbers that can be rounded to the number when rounded to the nearest 100.

300

1500

32 900

782 000

Explain the range of answers for 10 000.

Rounding to the powers of 1000

Write down the numbers which, when rounded to the nearest thousand, are rounded to 34 000:

33 672

34 829

30 999

34 002

33 903

32 919

34 500

33 499

33 501

34 201

Create your own set of numbers for a partner.

Rounding to the powers of 10 000

Write an explanation, with examples, of how to round any number to the nearest ten thousand.

Share your explanation with a partner. Can you improve your answer with any ideas from your partner?

Rounding to the powers of 100 000

Write two 6-digit numbers.

Add the numbers together and round the answer to the nearest 100 000.

Now round the original numbers and add them together.

Do you get the same answer?

Try it again with different numbers.

What do you find?

Maths Mastery

Rounding to the powers of 10

Answers

Rounding to the powers of 10 Answers

Work with a partner.

Write a number (up to 6 digits) on a small whiteboard (hidden).

Say the number to your partner who must round it to the nearest 10. If they get the answer correct, then it is their turn to write a number.

If your partner guesses an incorrect answer, then you will get a point.

Play to 10 points and then swap partners.

If your partner is finding it difficult, perhaps show them the numbers for a few seconds.

Rounding to the powers of 100 Answers

For each of these numbers, write five numbers that can be rounded to the number when rounded to the nearest 100.

300

1500

32 900

782 000

**Between
250 and
349**

**Between
1450 and
1549**

**Between
32 850 and
32 949**

**Between
781 950 and
782 049**

Explain the range of answers for 10 000.

Any number between 9 950 and 10 049

Rounding to the powers of 1000 Answers

Write down the numbers which, when rounded to the nearest thousand, are rounded to 34 000:

33 672

34 829

30 999

34 002

33 903

32 919

34 500

33 499

33 501

34 201

Create your own set of numbers for a partner.

Rounding to the powers of 10 000 Answers

Write an explanation, with examples, of how to round any number to the nearest ten thousand.

Share your explanation with a partner. Can you improve your answer with any ideas from your partner?

Every number is between two 10 000's.

We round to the nearest 10 000.

By convention the half way point goes up, so 6 500 rounds to 7 000.

Rounding to the powers of 100 000 Answers

Write two 6-digit numbers.

Add the numbers together and round the answer to the nearest 100 000.

Now round the original numbers and add them together.

Do you get the same answer?

Try it again with different numbers. What do you find?

Roughly half the answers will be the same; the rest will differ by 100 000. This is where both numbers are rounded up or both down by more than 50 000.

e.g. $225\ 000 + 325\ 000 = 550\ 000$ rounds to 600 000

$200\ 000 + 300\ 000 = 500\ 000$