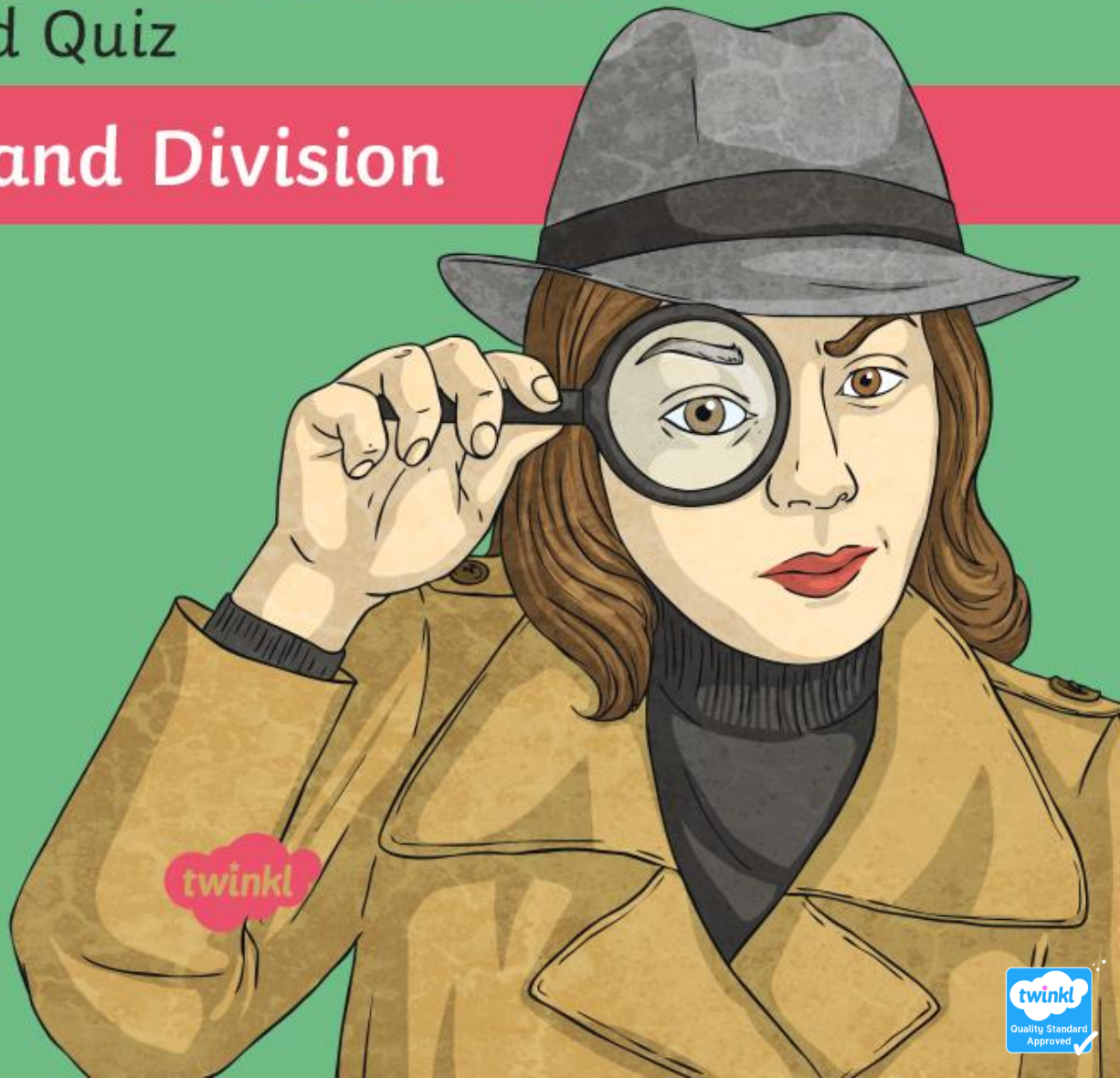
Maths SATs Survival

Revision Guide and Quiz

Multiplication and Division



Multiply numbers using the formal written methods of short and long multiplication	Recognise and use square numbers and cube numbers
Divide numbers using the formal written methods of short and long division	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
Interpret remainders as appropriate for the context	Use estimation to check answers to calculations
Identify common factors, common multiples and prime numbers	Use knowledge of the order of operations

Revise

Multiply numbers using the formal written methods of short and long multiplication

We can use formal written methods to multiply numbers.

Short Multiplication

We can use short multiplication when we are multiplying any number by a **one-digit** number.

Starting at the **right-hand side**, multiply each digit in the top number by the one-digit number.

We can only write a single digit in each column, so if the product is a two-digit number, we have to **regroup** the number and place into the next column.

	6	2	8
×			7
4	**3**	**9**	**6**
	1	5	

When we regroup we must remember to add this number to the multiplication answer of the next digit.

Revise

Multiply numbers using the formal written methods of short and long multiplication

We can use formal written methods to multiply numbers.

Long Multiplication

We can use long multiplication when we are multiplying two numbers which are both **two-digit** or **larger**.

Starting at the **right-hand side**, multiply each digit in the top number by the ones, regrouping and placing into the next column if necessary. Strike the regrouped numbers once you have your first answer so that you don't confuse any new regroupings.

On the next line, place a 0 in the ones column to show that you are about to multiply a power of ten. Multiply each digit in the top number by the tens digit, regrouping and placing into the next column if necessary.

Finally, add the digits in each column using column addition to find the answer to the multiplication.

	~~3~~	~~1~~ 1	~~2~~	
		5	8	3
	×		4	9
	5	2	4	7
2	3	3	2	0
2	**8**	**5**	**6**	**7**

Quiz

Multiply numbers using the formal written methods of short and long multiplication

What is the answer to this multiplication calculation?

$$4587 \times 7$$

32 109	28 569	32 209

Try again!

Quiz

Multiply numbers using the formal written methods of short and long multiplication

What is the answer to this multiplication calculation?

$$5694 \times 46$$

262 024

252 924

261 924

Try again!

Quiz

Multiply numbers using the formal written methods of short and long multiplication

What is the missing digit in this multiplication calculation?

		9	?	3
×				9
	8	8	4	7
		7	2	

8

9

7

Try again!

Quiz

Multiply numbers using the formal written methods of short and long multiplication

What is the missing digit in this multiplication calculation?

8

9

7

		6	7	4
	×		3	5
	3	3	?	0
2	0	2	2	0
2	**3**	**5**	**9**	**0**

Choose another objective

Try again!

Revise

Divide numbers using the formal written methods of short and long division

We can use formal written methods to divide numbers.

Short Division

We can use short division when we are dividing a number by a **one-digit** number.

Start by dividing the first digit of the dividend (the number that is being divided: 7392) by the divisor (the number that is being divided into: 6).

Write the answer above the horizontal line and regroup any remainder to the next digit.

Repeat the process until you are left with no remainder or until you have found the answer to the appropriate number of decimal places.

	1	2	3	2
6	7	$^{1}3$	$^{1}9$	$^{1}2$

Revise

Divide numbers using the formal written methods of short and long division

Long Division

We can use long division when we are dividing a number by a **two-digit** number or **larger**.

Start by dividing the first two digits of the dividend by the divisor. Write the answer above the horizontal line and the multiple of the divisor under the dividend.

Use column subtraction to calculate the remainder and draw down the next digit of the dividend.

Repeat this process until the end of the calculation.

		0	2	8	4
1	5	4	2	6	0
	-	3	0		
		1	2	6	
	-	1	2	0	
				6	0

Quiz

Divide numbers using the formal written methods of short and long division

What is the answer to this division calculation?

$$2688 \div 7$$

385	384	386

Try again!

Quiz

Divide numbers using the formal written methods of short and long division

What is the answer to this division calculation?

$$5544 \div 36$$

153

155

154

Try again!

Quiz

Divide numbers using the formal written methods of short and long division

What is the answer to this division calculation?

		3	4	8	?
5	1	7	$^{2}4$	$^{4}3$	$^{3}5$

8

9

7

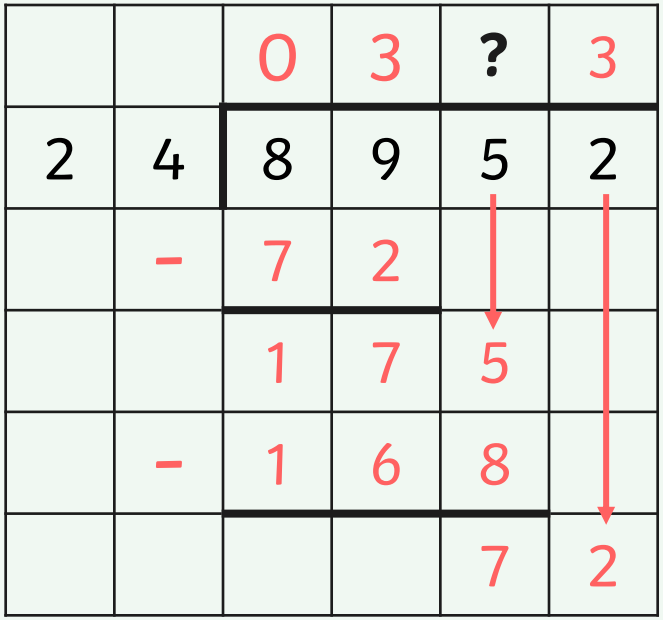
Try again!

Quiz

Divide numbers using the formal written methods of short and long division

What is the missing digit in this division calculation?

- 8
- 9
- 7



Choose another objective

Try again!

Revise

Interpret remainders as appropriate for the context

When the number being divided is not a multiple of the divisor we get a remainder. A remainder can be written as whole number, a fraction or a decimal.

Remainder	Example
Whole Number	$137 \div 5 = 27$ r 2
Fraction	$137 \div 5 = 27\frac{2}{5}$
Decimal	$137 \div 5 = 27.4$

For word problems involving remainders, we usually have to round the remainder up or down depending on the context.

Quiz

Interpret remainders as appropriate for the context

137 children are going on a school trip. Each coach seats 35 children. How many empty seats will there be on the fourth coach?

3	4	5

Try again!

Quiz

Interpret remainders as appropriate for the context

What is the correct fraction remainder for this division calculation?

$$453 \div 6$$

$\frac{1}{6}$	$\frac{1}{2}$	$\frac{5}{6}$

Correct!

Quiz

Interpret remainders as appropriate for the context

The capacity of a bucket is 1.76 litres. How many buckets can I fill completely with 10 litres of water?

6	5	7

Choose another objective

Try again!

Revise

Identify common factors, common multiples and prime numbers

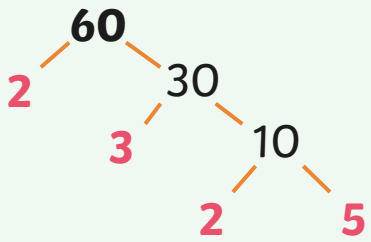
Factors, multiples and prime number all involve multiplication and division.

Multiple	Multiples are created when two numbers are multiplied together.	$6 \times 7 = 42$ 42 is a multiple of both 6 and 7.
Factor	Factors are the whole numbers that divide exactly into a given number.	42 The factors of 42 are 1, 42, 2, 21, 3, 14, 6, 7.
Common Multiples	Common multiples are found when the multiples of two or more numbers are compared.	Find three common multiples of 4 and 6. Multiples of 4: 4, 8, **12**, 16, 20, **24**, 28, **30** Multiples of 6: 6, **12**, 18, **24**, **30** Three common multiples are 12, 24 and 30.
Common Factors	Common factors are found when the factors of two or more numbers are compared.	Find the common factors of 12 and 30. Factors of 12: **1**, 12, **2**, **6**, **3**, 4 Factors of 30: **1**, 30, **2**, 15, **3**, 10, 5, **6** The common factors are 1, 2, 3 and 6.

Revise

Identify common factors, common multiples and prime numbers

Factors, multiples and prime number all involve multiplication and division.

Prime Numbers	Prime numbers are whole numbers that can only be divided by themselves and 1.	**Prime Numbers to 100:** 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97 **Remember: 1 is not a prime number.**
Prime Factors	The factors of a number that are prime.	 2 × 2 × 3 × 5 = 60 So the prime factors of 60 are 2, 2, 3 and 5

Quiz

Identify common factors, common multiples and prime numbers

Which number is a factor of 21?

2	3	4

Try again!

Quiz

Identify common factors, common multiples and prime numbers

Which number is a common multiple of 4 and 9?

106

110

108

Try again!

Quiz

Identify common factors, common multiples and prime numbers

Which group of numbers shown the common factors of 24 and 32?

1, 2, 4, 8

1, 2, 3, 8

1, 2, 4, 6

Try again!

Quiz

Identify common factors, common multiples and prime numbers

Which of these is a prime number?

87	88	89

Try again!

Quiz

Identify common factors, common multiples and prime numbers

Which calculation shows the prime factors of 90?

$2 \times 2 \times 3 \times 5$

$2 \times 3 \times 3 \times 5$

$2 \times 3 \times 5 \times 7$

Choose another objective

Try again!

Revise

Recognise and use square numbers and cube numbers

Square Numbers
A square number is created by multiplying a whole number by itself.

The process of squaring a number is represented by the small digit two written after the number being multiplied by itself.

$1 \times 1 = 1$	$1^2 = \mathbf{1}$
$2 \times 2 = 4$	$2^2 = \mathbf{4}$
$3 \times 3 = 9$	$3^2 = \mathbf{9}$
$4 \times 4 = 16$	$4^2 = \mathbf{16}$
$5 \times 5 = 25$	$5^2 = \mathbf{25}$

Cube Numbers
A cube number is made by multiplying a whole number by itself and by itself again.

The process of cubing a number is represented by the small digit three written after the number being multiplied by itself and by itself again.

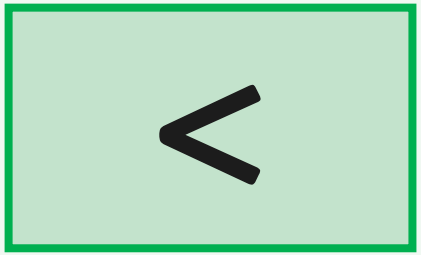
$1 \times 1 \times 1 = 1$	$1^3 = \mathbf{1}$
$2 \times 2 \times 2 = 8$	$2^3 = \mathbf{8}$
$3 \times 3 \times 3 = 27$	$3^3 = \mathbf{27}$
$4 \times 4 \times 4 = 64$	$4^3 = \mathbf{64}$
$5 \times 5 \times 5 = 125$	$5^3 = \mathbf{125}$

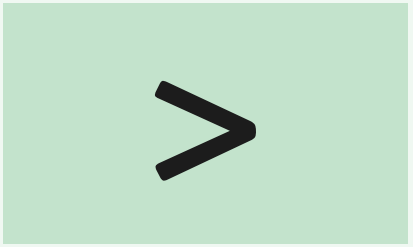
Quiz

Recognise and use square numbers and cube numbers

Choose the correct symbol to compare these calculations.

5^2 $\boxed{<}$ $120 \div 4$





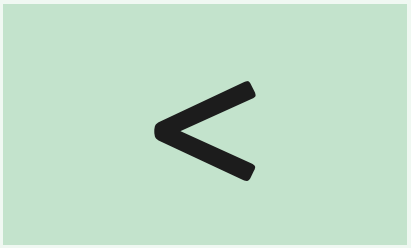
Try again!

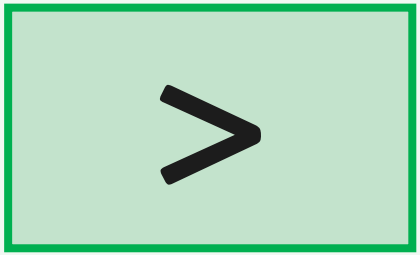
Quiz

Recognise and use square numbers and cube numbers

Choose the correct symbol to compare these calculations.

8^2 $\boxed{>}$ $70 - 8$





Try again!

Quiz

Recognise and use square numbers and cube numbers

Choose the correct symbol to compare these calculations.

4^3 $\boxed{>}$ 7^2

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Choose another objective

Try again!

Revise

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

When we multiply a number by a power of 10, the digits move to the left.

× 10	The digits move **one** place to the **left**	6.5 × 10 = 65
× 100	The digits move **two** places to the **left**	6.5 × 100 = 650
× 1000	The digits move **three** places to the **left**	6.5 × 1000 = 6500

When we divide a number by a power of 10, the digits move to the right.

÷ 10	The digits move **one** place to the **right**	6.5 ÷ 10 = 0.65
÷ 100	The digits move **two** places to the **right**	6.5 ÷ 100 = 0.065
÷ 1000	The digits move **three** places to the **right**	6.5 ÷ 1000 = 0.0065

When we need to multiply or divide larger numbers which involve multiples of 10, 100 or 1000, we can use our understanding of powers of 10 to make the calculation easier.

6 × 8000 is the same as 6 × 8 × 1000 = 48 × 1000 = 48 000

4200 ÷ 7 is the same as (42 ÷ 7) × 100 = 6 × 100 = 600

Quiz

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

Which number completes the calculation pattern?

7.832	÷	10	=	0.7832
78.32	÷	100	=	0.7832
783.2	÷	?	=	0.7832
7832	÷	10 000	=	0.7832

10

100

1000

Try again!

Quiz

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

Which number completes the calculation pattern?

0.9305	×	10	=	9.305
0.9305	×	100	=	?
0.9305	×	1000	=	930.5
0.9305	×	10 000	=	9305

93.05

9.305

930.5

Try again!

Quiz

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

What is the answer to this division calculation?

$$26.88 \div 100$$

2.688	0.2688	0.02688

Try again!

Quiz

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

What is the answer to this multiplication calculation?

$$5.0721 \times 1000$$

507.21	50.721	5072.1

Choose another objective

Try again!

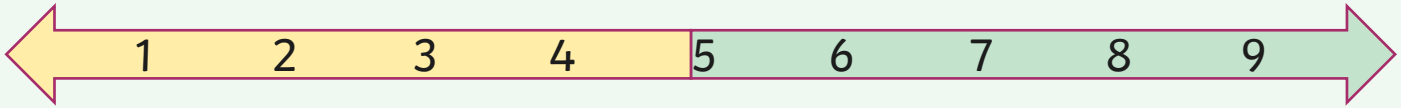
Revise

Use estimation to check answers to calculations

Estimating is a strategy used for checking the accuracy of a calculation.

By rounding the numbers in a calculation, we can estimate an answer before or after calculating.

When rounding a number, remember to look at the digit immediately to the right of the place value position you are rounding to.



If the digit immediately to the right of the place value position you are rounding to is **1, 2, 3 or 4,** we round the number **down**.

If the digit immediately to the right of the place value position you are rounding to is **5, 6, 7, 8 or 9,** we round the number **up**.

Quiz

Use estimation to check answers to calculations

Which multiplication calculation has an approximate answer of 6900?

243 × 37	232 × 33
219 × 31	277 × 38

Try again!

Quiz

Use estimation to check answers to calculations

Which calculation is a sensible estimate for the calculation 2735 × 52?

2730 × 60	2740 × 60
2740 × 50	2730 × 45

Choose another objective

Try again!

Revise

Use knowledge of the order of operations

If a calculation or problem involves more than one operation, it is important to do the operations in the correct order.

Brackets	Calculations inside a bracket are always worked out first.	$63 \div (25 - 16) =$ $63 \div 9 = 7$
Orders/ **I**ndices	Orders or indices refer to square numbers or cube numbers. These should be calculated next.	$8^2 \div 4 =$ $64 \div 4 = 16$
Division **M**ultiplication	Now calculate any multiplication or division in the order they appear from left to right.	$2 \times 7 + 63 \div 9 =$ $14 + 7 = 21$
Addition **S**ubtraction	Finally, calculate any addition or subtraction in the order they appear from left to right.	$81 - 24 \div 6 + 3 =$ $81 - 4 + 3 = 80$

Quiz

Use knowledge of the order of operations

What is the answer to this calculation?

$$(12 \times 28) + 534$$

865	870	875

Try again!

Quiz

Use knowledge of the order of operations

What is the answer to this calculation?

$$1450 \div (18 + 7)$$

58	59	60

Try again!

Quiz

Use knowledge of the order of operations

What is the answer to this calculation?

$$(260 \div 8) \times 24$$

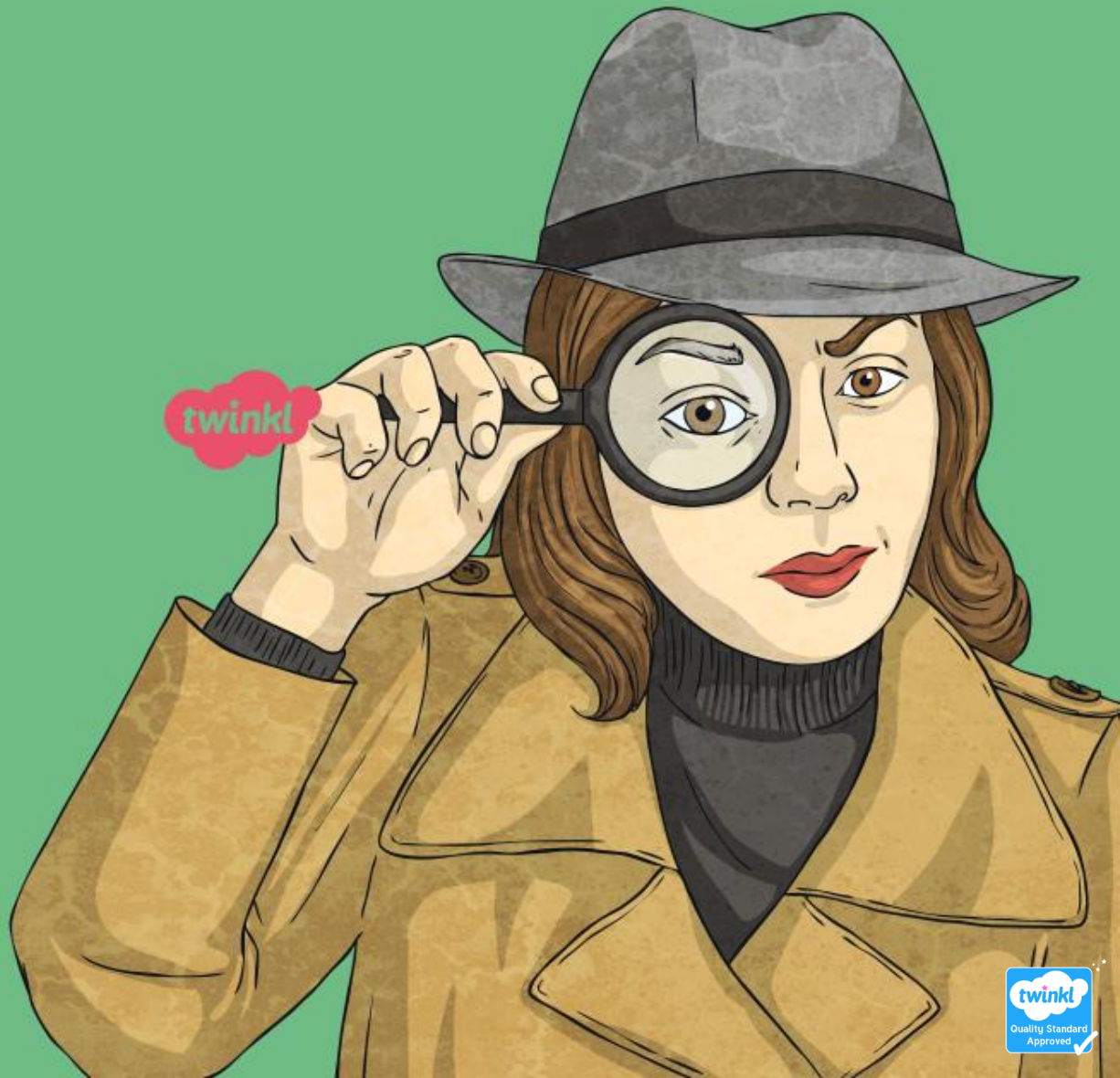
760

770

780

Choose another objective

Try again!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