Mathematics

Number and Algebra

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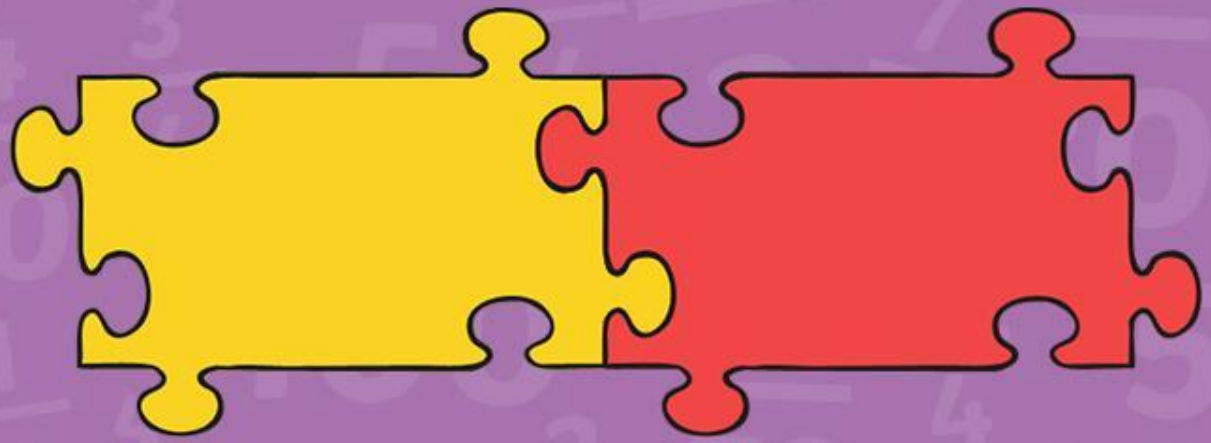
Decimal Place Value Puzzles



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Aim

- To multiply and divide numbers by 10, 100 and 1000 to solve number puzzles.

Success Criteria

- I can multiply and divide numbers by 10, 100 and 1000, giving answers up to three decimal places.
- I can multiply and divide a sequence of numbers by 10, 100 or 1000 to solve a number problem.

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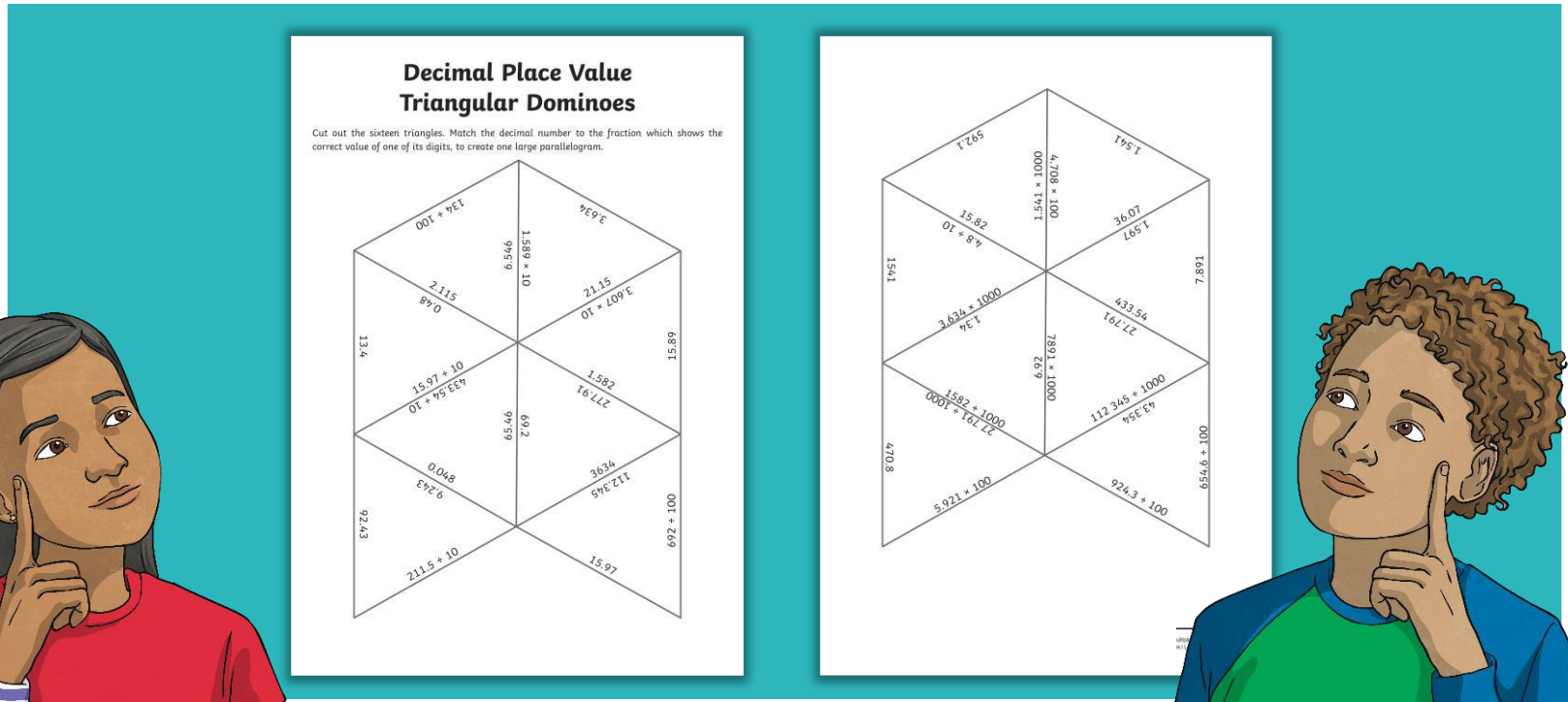
Tarisa Triangles Domino Puzzles

Match the edges of the triangles together by multiplying and dividing the decimals by 10, 100 or 1000.



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Multiplying by 10, 100 and 1000

When we multiply a number by 10, 100, or 1000, we move the digits of the number to the left:

- one place for 10
- two places for 100
- three places for 1000

Notice that the number of places we move the digits is the same as the number of zeroes in the number we are multiplying by.

× 1000 × 10 × 100 × 10

Thousands	Hundreds	Tens	Ones	tenths	hundredths	thousandths
			4	0	7	

4.07 x 10 = 40.7

4.07 x 100 = 407

4.07 x 1000 = 4070

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Dividing by 10, 100 and 1000

When we divide a number by 10, 100, or 1000, we move the digits of the number to the right:

- one place for 10
- two places for 100
- three places for 1000

Notice that the number of places we move the digits is the same as the number of zeroes in the number we are dividing by.

÷ 10 ÷ 100 ÷ 1000 ÷ 10 ÷ 100 ÷ 1000

Thousands	Hundreds	Tens	Ones	tenths	hundredths	thousandths
	5	0	8			

508 ÷ 10 = 50.8

508 ÷ 100 = 5.08

508 ÷ 1000 = 0.508

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Missing Number Puzzle

Here is a number sentence involving multiplying and dividing decimals.

One of the numbers has been replaced by a shape.
How can we use our place value reasoning to calculate the value of the shape?

$$5.6 \times 10 \times 10 \times \bigstar \times 10 = 22\,400$$

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Missing Number Puzzle

First, simplify the calculation:

$5.6 \times 10 \times 10 \times \bigstar \times 10 = 22\,400$

$(5.6 \times 100) \times \bigstar \times 10 = 22\,400$

$560 \times \bigstar \times 10 = 22\,400$

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Missing Number Puzzle

Next, use inverse operations to eliminate any extra calculations:

560 × ★ × 10 = 22 400

560 × ★ × 10 = 22 400 ÷ 10

560 × ★ = 2240

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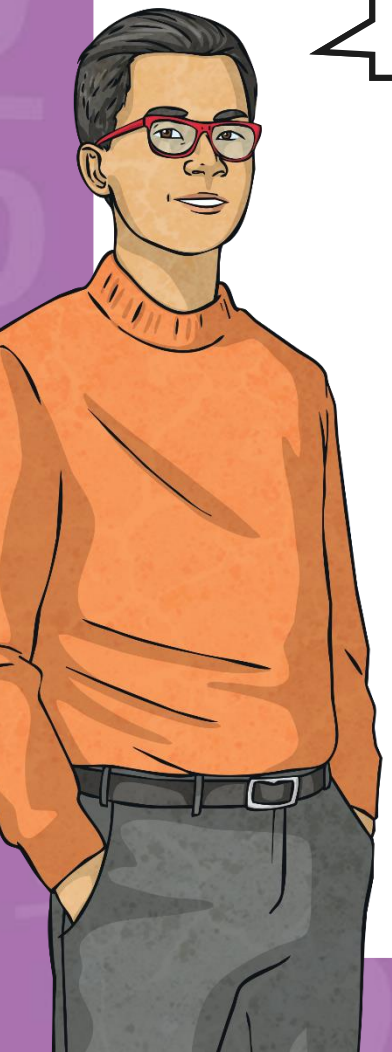
Missing Number Puzzle



How many times does 56 go into 224?

560 × ★ = 2240

2240 ÷ ★ = 560

2240 ÷ 560 = ★

= ★ 4

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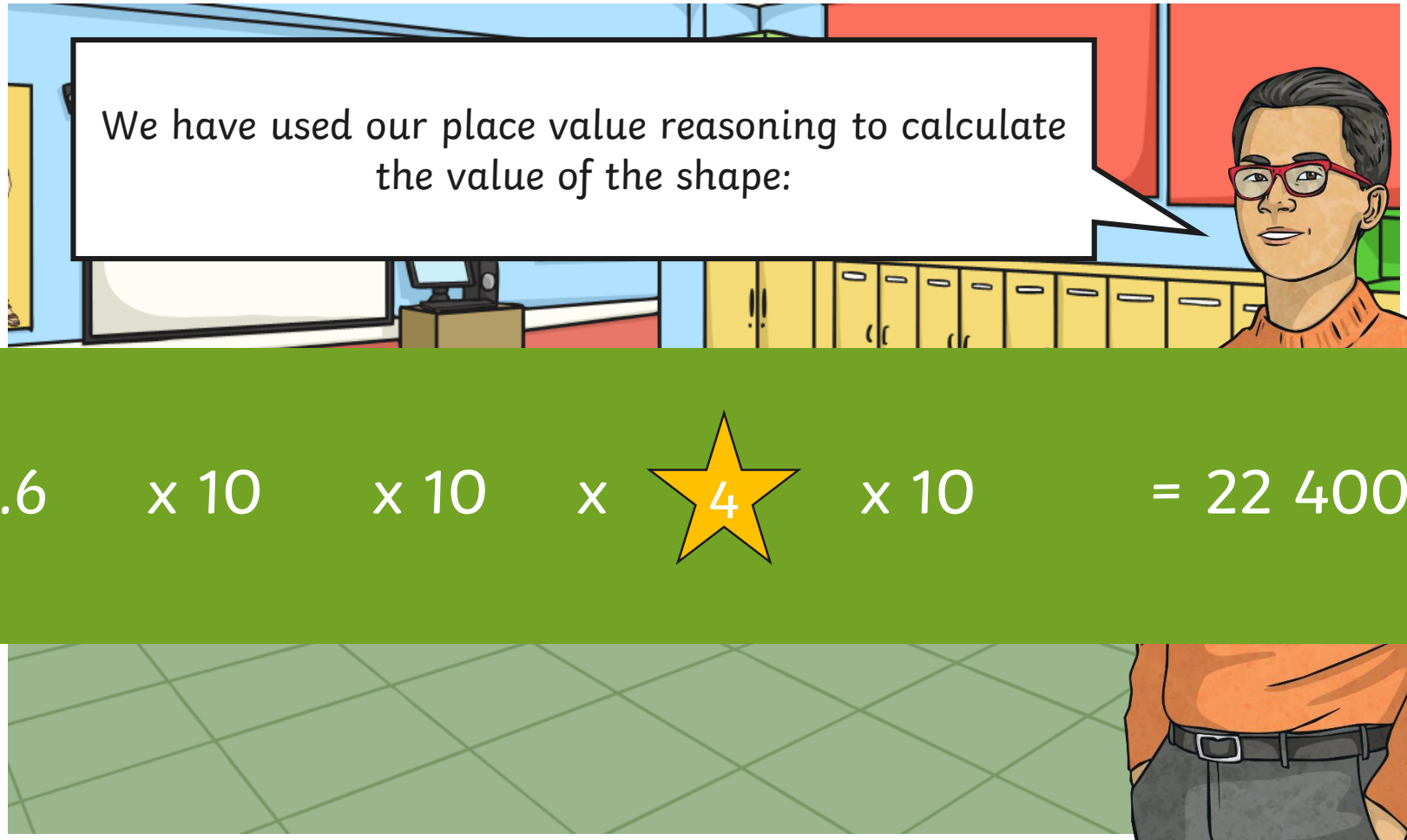
Missing Number Puzzle



5.6 x 10 x 10 x ★ x 10 = 22 400

★ = 4

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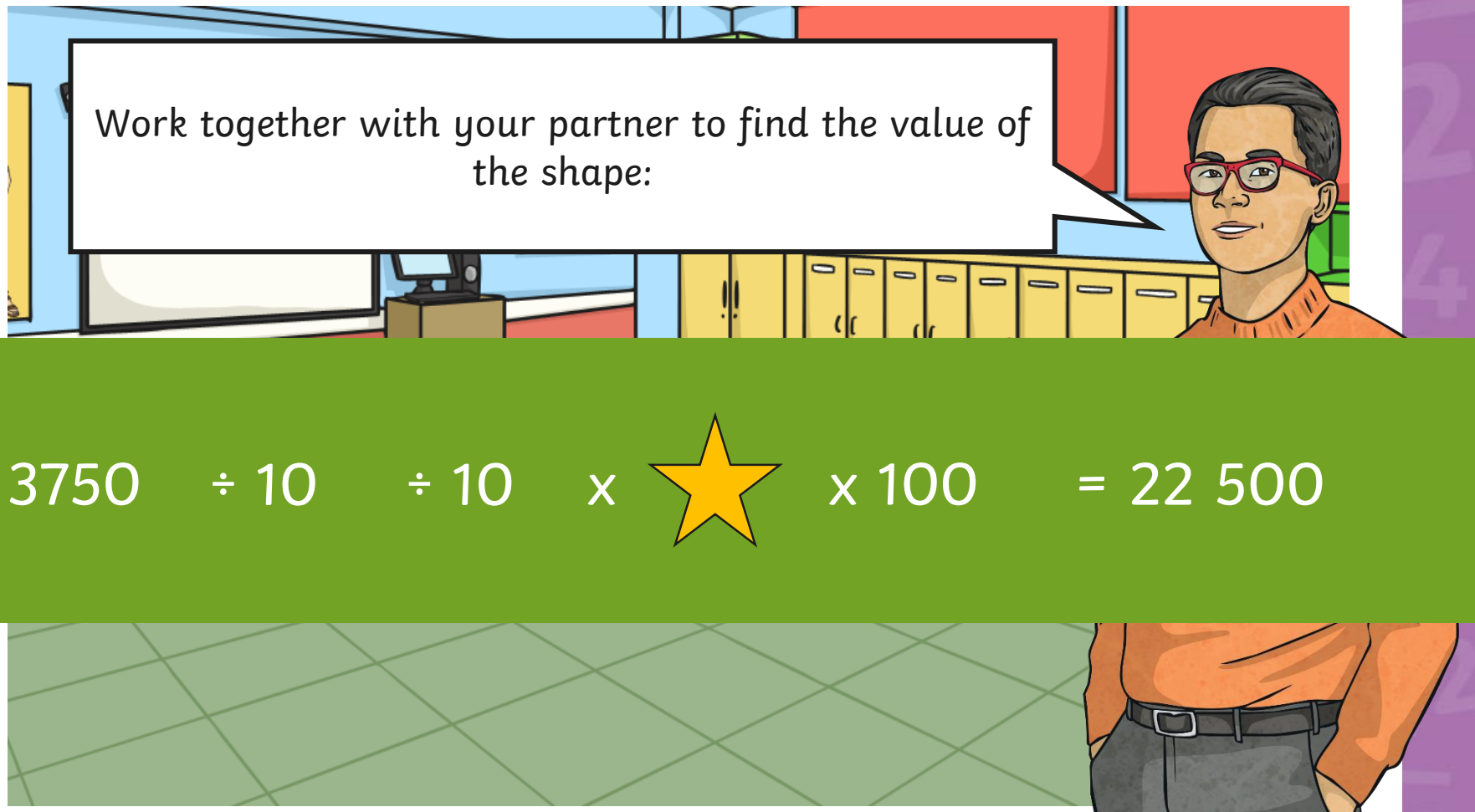
Partner Missing Number Puzzle



3750 ÷ 10 ÷ 10 x ★ x 100 = 22 500

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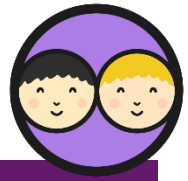
Partner Missing Number Puzzle



Work together with your partner to find the value of the shape:

$3750 \div 10 \div 10 \times \bigstar \times 100 = 22\,500$

$(3750 \div 100) \times \bigstar \times 100 = 22\,500$

$37.5 \times \bigstar = 22\,500 \div 100$

$37.5 \times \bigstar = 225$

$37.5 \times 6 = 225$

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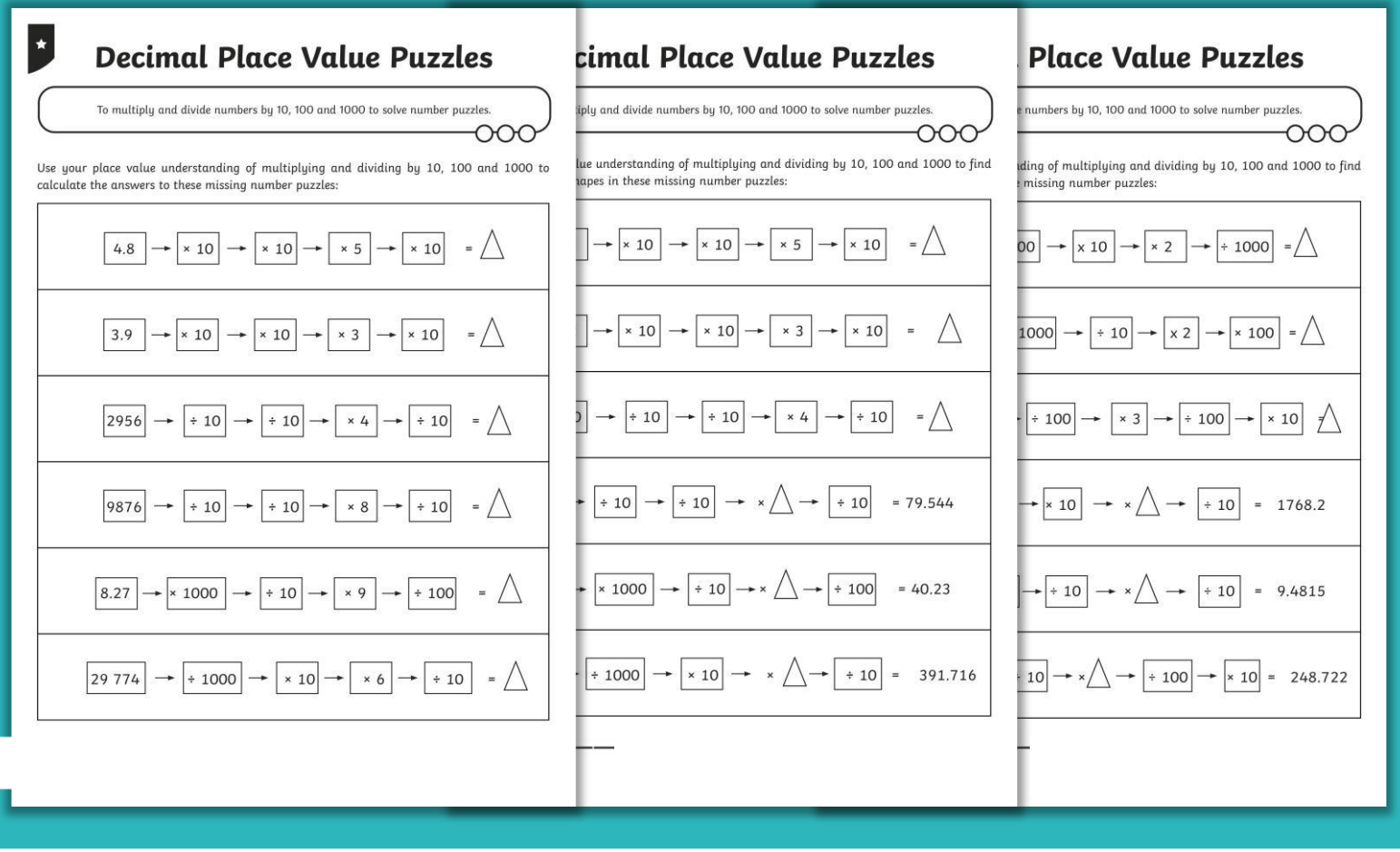
Decimal Place Value Puzzles



Decimal Place Value Puzzles

To multiply and divide numbers by 10, 100 and 1000 to solve number puzzles.

Use your place value understanding of multiplying and dividing by 10, 100 and 1000 to calculate the answers to these missing number puzzles:

4.8	× 10	× 10	× 5	× 10	= △
3.9	× 10	× 10	× 3	× 10	= △
2956	÷ 10	÷ 10	× 4	÷ 10	= △
9876	÷ 10	÷ 10	× 8	÷ 10	= △
8.27	× 1000	÷ 10	× 9	÷ 100	= △
29 774	÷ 1000	× 10	× 6	÷ 10	= △

cimal Place Value Puzzles

iply and divide numbers by 10, 100 and 1000 to solve number puzzles.

ue understanding of multiplying and dividing by 10, 100 and 1000 to find apes in these missing number puzzles:

	× 10	× 10	× 5	× 10	= △
	× 10	× 10	× 3	× 10	= △
	÷ 10	÷ 10	× 4	÷ 10	= △
	÷ 10	÷ 10	× △	÷ 10	= 79.544
	× 1000	÷ 10	× △	÷ 100	= 40.23
	÷ 1000	× 10	× △	÷ 10	= 391.716

Place Value Puzzles

numbers by 10, 100 and 1000 to solve number puzzles.

ding of multiplying and dividing by 10, 100 and 1000 to find missing number puzzles:

00	x 10	× 2	÷ 1000	= △	
1000	÷ 10	x 2	× 100	= △	
	÷ 100	× 3	÷ 100	× 10	= △
	× 10	× △	÷ 10	=	1768.2
	÷ 10	× △	÷ 10	=	9.4815
10	× △	÷ 100	× 10	=	248.722

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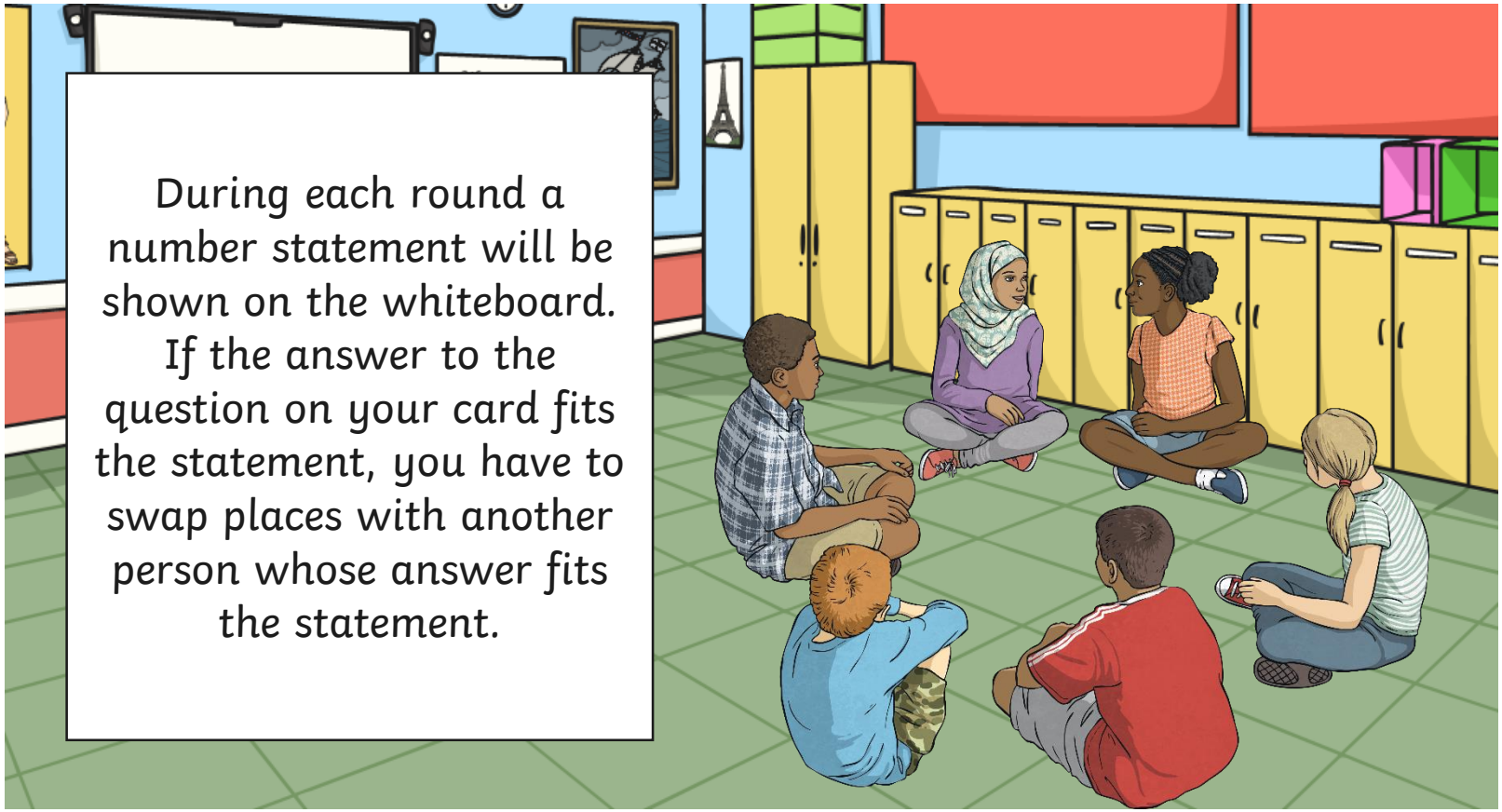
Circle Game

Whole Class

Hand out the question cards and sit or stand in a circle facing inwards.



During each round a number statement will be shown on the whiteboard. If the answer to the question on your card fits the statement, you have to swap places with another person whose answer fits the statement.

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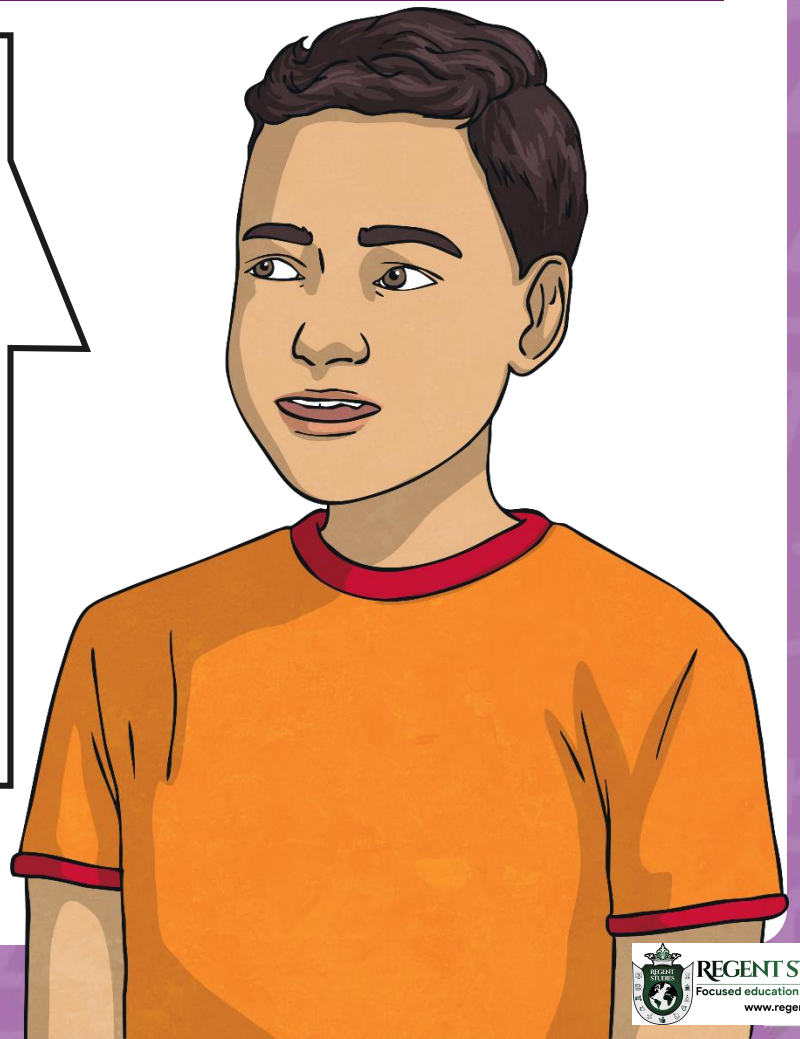
Circle Game

Whole Class

Round 1

Change places if the answer to your question has an **even tenths digit**.



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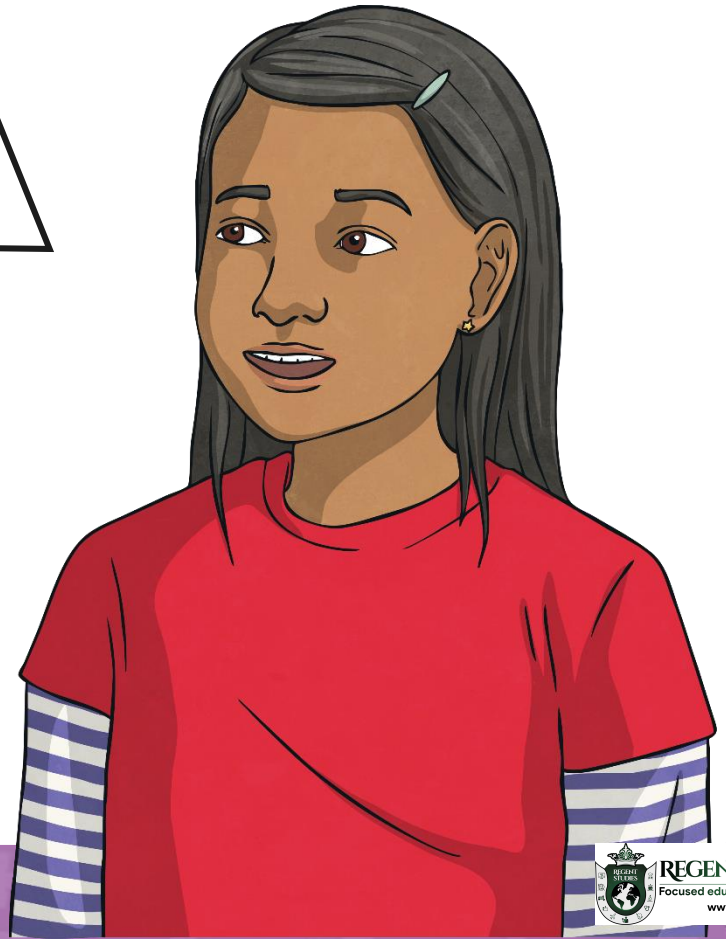
Circle Game

Whole Class

Round 2

Change places if the answer to your question has an **odd tenths digit**.



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Circle Game

Round 3

Change places if the answer to your question has an **odd ones digit**.

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Circle Game

Whole Class

Round 4

Change places if the answer to your question has an **even ones digit**.

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Circle Game

Whole Class

Round 5

Change places if the answer to your question has an **even digit sum**.

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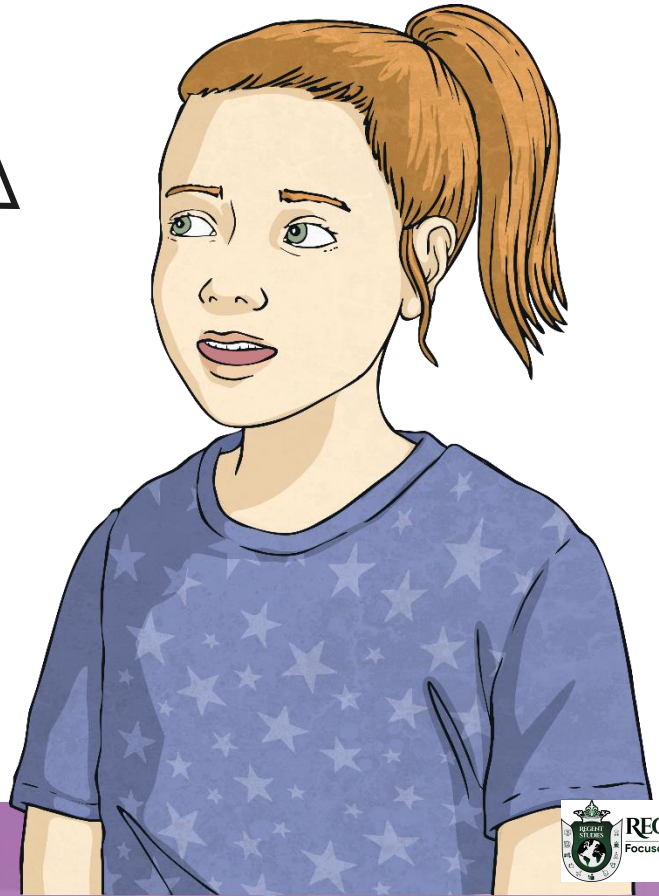
Circle Game

Whole Class

Round 6

Change places if the answer to your question has an **odd digit sum**.



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