

Y6 & Y7 Fraction, Decimal, Percentage and Ratio Starters

41 410

x 10	x 100	x 1000
÷ 10	÷ 100	÷ 1000

What is $\frac{1}{5}$ of 10?

Answer =

Work out 40% of 100.

Answer =

$\frac{7}{8}$

$\frac{1}{9}$	$\frac{16}{28}$	$\frac{1}{7}$	$\frac{3}{6}$	$\frac{4}{18}$
$\frac{3}{5}$	$\frac{9}{15}$	$\frac{2}{9}$	$\frac{4}{36}$	$\frac{2}{14}$
$\frac{1}{4}$	$\frac{10}{16}$	$\frac{1}{2}$	$\frac{4}{7}$	$\frac{5}{8}$
$\frac{4}{6}$	$\frac{12}{16}$	$\frac{3}{12}$	$\frac{2}{3}$	$\frac{3}{4}$

1%	37%	19%	$\frac{29}{100}$	$\frac{37}{100}$	$\frac{73}{100}$
66%	13%	17%	$\frac{1}{4}$	$\frac{17}{100}$	$\frac{1}{100}$
25%	29%	73%	$\frac{19}{100}$	$\frac{13}{100}$	$\frac{2}{3}$

			27:3		
7:1					

Fraction, Decimal, Percentage and Ratio Interactive Starters

Spire Maths Interactives

<https://spiremaths.co.uk/ia/>

There are 9 Interactives in this area: each with three levels. The titles of the interactives are given below. Brief teacher notes are given for each interactive.

Unfortunately flash files will not work on iPads or iPhones.

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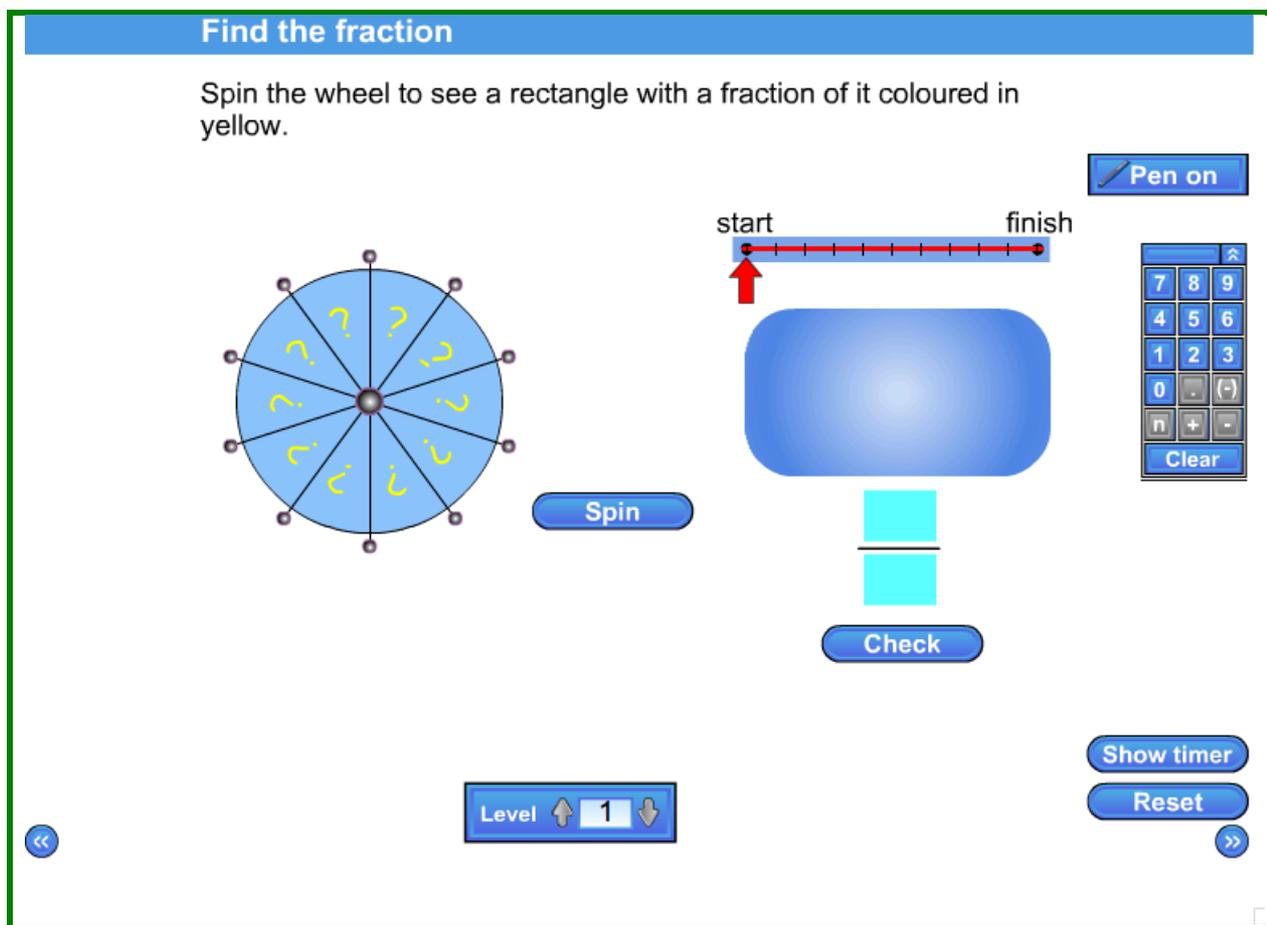
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Find the fraction

OBJECTIVE(S): Use fraction notation to describe parts of shapes: simplify fractions by cancelling all common factors and identify equivalent fractions

DESCRIPTION: A 'spin the wheel' starter where you are asked to complete a 'blank' fraction to describe the shaded portion of a given rectangle of squares



The screenshot shows the 'Find the fraction' game interface. On the left is a wheel divided into 10 segments, each containing a question mark. Below the wheel is a 'Spin' button. To the right of the wheel is a horizontal scale from 0 to 10, with 'start' at 0 and 'finish' at 10. A red arrow points to the 'start' position. Below the scale is a large blue rounded rectangle representing a fraction box, with a horizontal line for a denominator and a space for a numerator. Below the fraction box is a 'Check' button. To the right of the fraction box is a numeric keypad with digits 0-9, a decimal point, a negative sign, and a 'Clear' button. Above the keypad is a 'Pen on' button. At the bottom center is a 'Level' selector showing '1' with up and down arrows. At the bottom right are 'Show timer' and 'Reset' buttons. Navigation arrows are visible in the bottom left and right corners.

A wheel, a working space and a blank numerator and denominator of a fraction are presented on the screen. Clicking the spin button produces a rectangular grid of squares with some squares shaded. You are invited to complete the fraction. A correct solution (verified by 'Check') moves a pointer along a 10 point scale. Solutions are expected to be in their lowest form though correct equivalents are acknowledged.

There are 3 levels differentiated by dimensions of grid and arrangement of shaded squares.

The timer can be used (it runs whether shown or hidden) to show the total time taken to answer all ten questions.

The activity should not come to be regarded as simply putting one number on top of another but rather as an opportunity to put this in a concrete situation. Reducing fractions to their lowest form is important here. Can the patterns on the grid be used to reflect this?

Spire Maths interactive files available in a flash format at: <https://spiremaths.co.uk/ia/>

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Equivalent fractions

OBJECTIVE(S): Simplify fractions by cancelling all common factors and identify equivalent fractions.

DESCRIPTION: A 20 card matching challenge in which pupils are asked to pair equivalent fractions.

The 3 levels are differentiated by the magnitude of the numbers used for the numerator and the denominator.

Equivalent fractions

Click on the equivalent fraction.

Pen on

	$\frac{15}{21}$	$\frac{8}{9}$	$\frac{5}{7}$	$\frac{16}{36}$
$\frac{8}{28}$	$\frac{7}{8}$	$\frac{3}{12}$	$\frac{3}{7}$	
$\frac{1}{4}$	$\frac{16}{18}$	$\frac{2}{12}$	$\frac{9}{21}$	$\frac{4}{7}$
$\frac{2}{7}$	$\frac{4}{9}$	$\frac{8}{14}$	$\frac{28}{32}$	$\frac{1}{6}$

Level \updownarrow 1 \updownarrow

New
Repeat
Show timer
Reset

« »

Ten pairs of equivalent fractions are presented on cards (face shown) in a 4 by 5 array. Pupils are invited to click on cards in order to try and find matching pairs. If the fractions selected are equivalent then the 'It's a match' message is shown and the cards disappear from the screen. If the selected fractions are not equivalent then a 'No match' message is shown.

The 3 levels are differentiated by the magnitude of the numerators and denominators in the various fractions.

The timer can be used (it runs whether shown or hidden) to show the total time taken to find all ten matching pairs.

Spire Maths interactive files available in a flash format at: <https://spiremaths.co.uk/ia/>

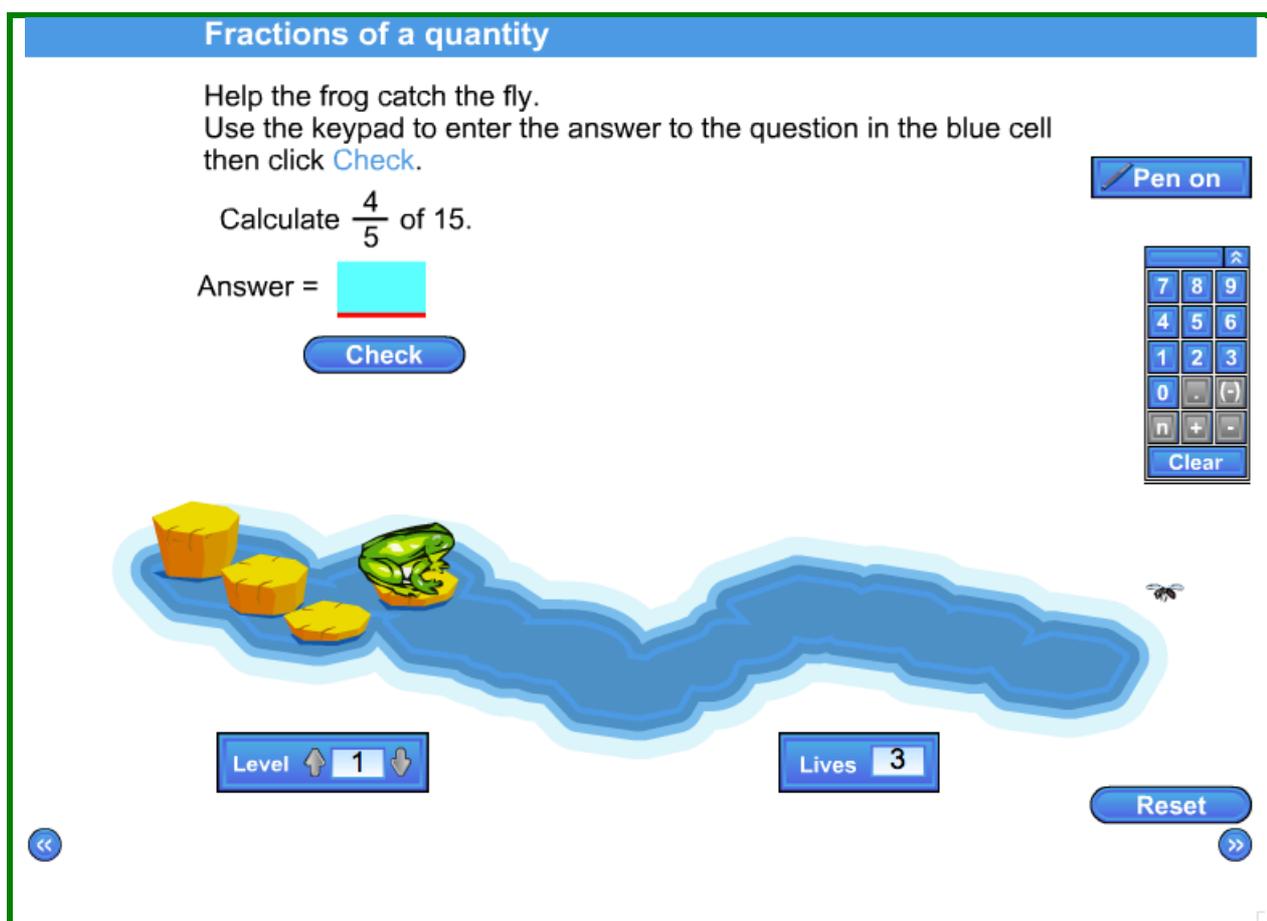
Unfortunately they will not work on iPads or iPhones.

Fractions of a quantity

OBJECTIVE(S): Consolidate and extend mental methods of calculation to include fractions; calculate simple fractions of quantities.

DESCRIPTION: A 'stepping stones' starter where you have to 'step' a frog across ten stepping stones. A 'step' is achieved when the correct response to a 'fraction of a quantity' question is entered from a keypad. The frog has 3 lives.

The 3 levels are differentiated by the magnitude of the numbers involved.



A question, response cell and key pad are presented on the screen. Pupils are asked to find the fraction of a given numerical quantity entering the answer with the keypad. If they get the correct answer a frog moves to the next stepping stone (there are 10 in all). If they get it wrong they lose a life (they have 3 lives). On crossing all stepping stones the frog eats a fly.

The 3 levels are differentiated by the fractions and the magnitude of the given quantity.

When common errors and misconceptions are evident from responses given, it is suggested that the 'pen' is used to work through responses in the workspace available on the screen or to follow it up later.

Spire Maths interactive files available in a flash format at: <https://spiremaths.co.uk/ia/>

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Decimals to a fraction

OBJECTIVE(S): Simplify fractions by cancelling all common factors; convert terminating decimals to fractions e.g. $0.23 = 23/100$

DESCRIPTION: Pupils are shown 9 decimals and the 9 corresponding fractions (in simplest form). A '9 pair card matching' starter with 3 levels (differentiated by decimal and how it can be reduced).

Decimals to a fraction

The card on the left shows a decimal.
The card on the right shows a fraction.
Match each card on the left with the correct card on the right.

It's a match!

Pen on

0.001	0.5	0.07	$\frac{3}{10}$	$\frac{7}{100}$	
0.3	0.43	0.9	$\frac{79}{100}$	$\frac{1}{1000}$	$\frac{9}{10}$
0.79	0.17		$\frac{17}{100}$	$\frac{43}{100}$	$\frac{1}{2}$

Level \updownarrow 1 \updownarrow

New
Replay
Reset

« »

Two sets of 3 by 3 cards are shown on the screen (contents of cards are visible). You can select one card from each side. The left-hand side shows a decimal, the right-hand side shows matching fractions in lowest terms. The object is to match the two sides.

The same cards can be replayed but the positions are changed.

There are 3 levels differentiated by decimal and how it can be reduced.

Spire Maths interactive files available in a flash format at: <https://spiremaths.co.uk/ia/>

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Finding percentages

OBJECTIVE(S): Calculate simple percentages.

DESCRIPTION: Pupils are asked to find a percentage of a quantity. A '4 by 4 square' starter where pupils have to answer sixteen percentage of quantity-type questions. Timer available. To speed the activity up you can click on the orange cell without entering an answer in the blue cell.

Finding percentages

Use the keypad to enter your answer in the blue cell.
Click **Check** to see if you are correct.

	✓		

Find 40% of 90.

Answer = Level 1

Pupils can choose any one of sixteen cells on a 4 by 4 grid. A question appears of the form 'What is a % of b' where a and b vary depending on the level chosen. Level 1 uses percentages that are multiples of 10% and numbers that are multiples of 10; level 2 uses percentages that are multiples of 5% and numbers that are multiples of 10; level 3 uses percentages that are multiples of 10 with integers.

Answers can be 'entered' in the blue cell and then checked. To speed up the process, the original cell (which turns orange on clicking) can be clicked again to signify a correct (oral) answer. Another cell can then be selected.

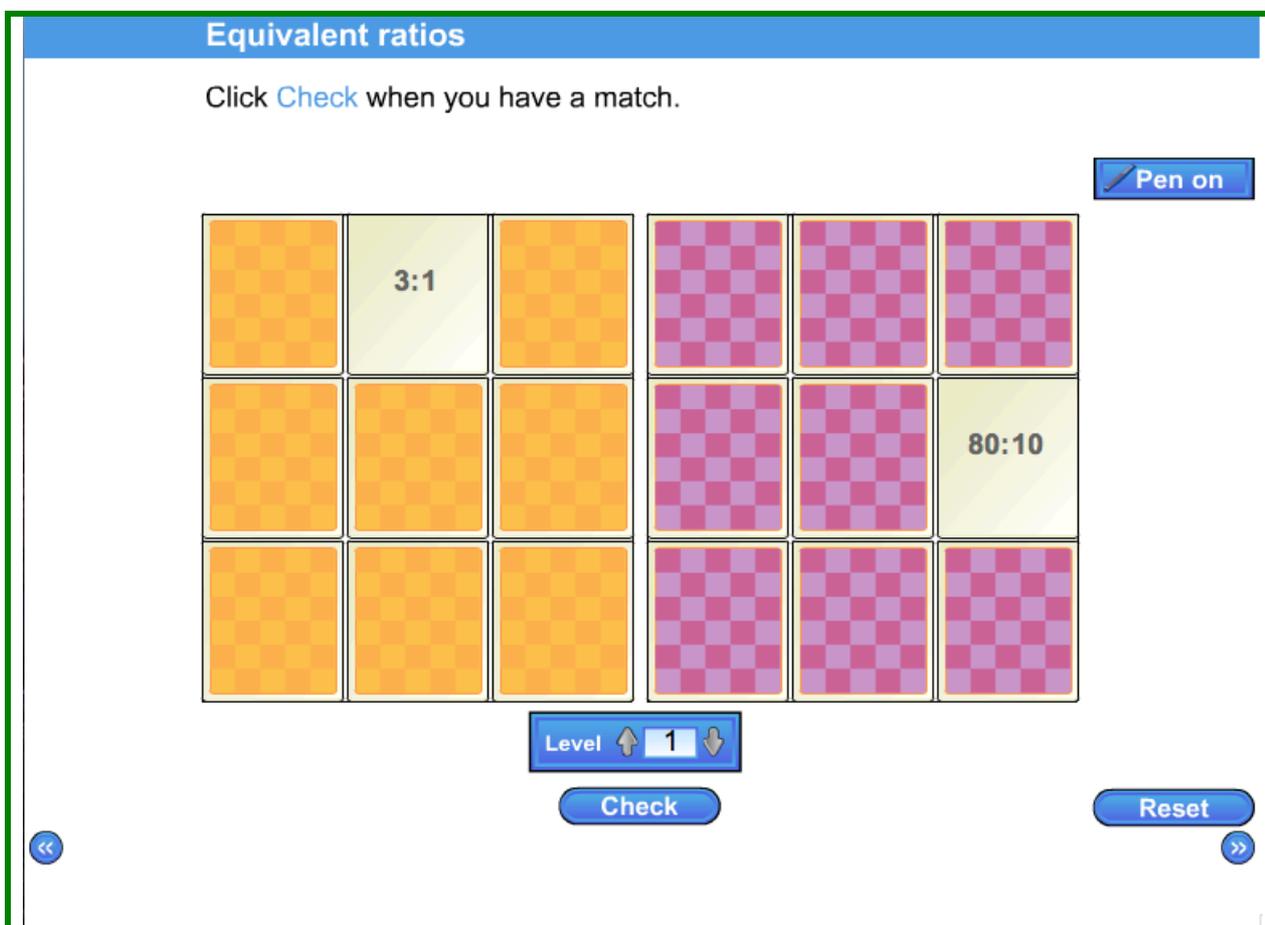
The timer can be used to show the total time taken to answer all sixteen questions (the timer works even when it is not visible).

Spire Maths interactive files available in a flash format at: <https://spiremaths.co.uk/ia/>

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Equivalent ratios

OBJECTIVE(S): Use ratio notation; reduce a ratio to its simplest form.
DESCRIPTION: A '9 pair card matching' matching starter in which pupils have to find equivalent ratios expressed in different terms. The 3 levels are differentiated by the magnitude of the numbers involved.



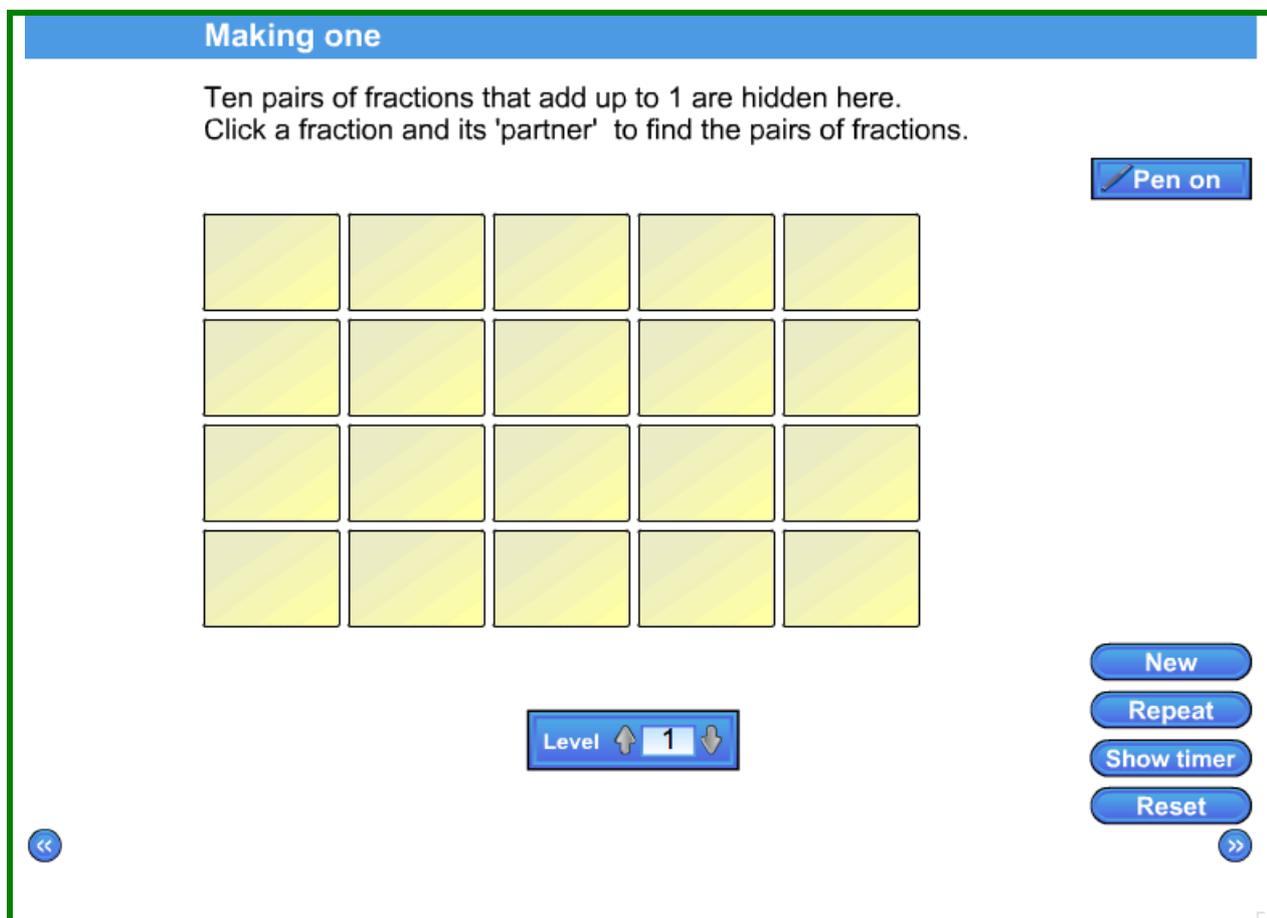
Nine pairs of matching cards, in two 3 by 3 arrays, are shown with faces hidden. Pupils are invited to 'Click' a card from the left-hand array to turn it and reveal a ratio expressed in its lowest terms. The aim is to 'Click' a card from the right hand array to turn it and reveal an equivalent ratio, not in its lowest terms. Pairings can be validated using the 'Check' button. Whilst only one card from each array can be seen at any one time, any card can be turned at any stage. A correct pairing produces the message 'It's a match!' and the corresponding cards disappear from the screen. When all cards are successfully paired, a 'Match complete!' message is displayed. The 3 levels are differentiated by the magnitude and number of the values involved.

Spire Maths interactive files available in a flash format at: <https://spiremaths.co.uk/ia/>

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Making one

OBJECTIVE(S): Begin to add and subtract simple fractions and those with common denominators;
DESCRIPTION: A twenty card matching challenge in which pupils are asked to pair fractions that sum to unity.
The 3 levels are differentiated by the magnitude of the values involved.



Ten pairs of complementary fractions (sum to one) are presented on cards (faces hidden) in a 4 by 5 array. Pupils are invited to click on cards in order to reveal and try and find matching fractions. If the fractions selected sum to one then the 'It's a match' message is shown and the cards disappear from the screen. If the selected fractions are not equivalent then a 'No match' message is shown.

The 3 levels are differentiated by the magnitude of the values in numerators and denominators. The timer can be used (it runs whether shown or hidden) to show the total time taken to find all ten matching pairs.

Spire Maths interactive files available in a flash format at: <https://spiremaths.co.uk/ia/>

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OBJECTIVE(S):

Recognise the equivalence of percentages and fractions.

DESCRIPTION:

A '9 pair matching' starter in which pupils have to find a number representing a word written in a simple code. The 3 levels are differentiated by the fractions involved; some percentages at levels 2 and 3 include decimals (for example for the fraction 29/1000).

Fractions and percentages

The card on the left shows a percentage.
The card on the right shows a fraction.
Match each card on the left with the correct card on the right.

Pen on

29%	13%	0.1%	$\frac{1}{1000}$	$\frac{3}{10}$	$\frac{13}{100}$
25%	30%	50%	$\frac{1}{2}$	$\frac{29}{100}$	$\frac{83}{100}$
1%	61%	83%	$\frac{1}{100}$	$\frac{1}{4}$	$\frac{61}{100}$

Level ↑ 1 ↓

New
Replay
Reset
>>

<<

Nine pairs of matching cards, in two 3 by 3 arrays, are presented with faces shown. The array on the left-hand side shows percentages. The array on the right shows fractions. Pupils are invited to 'Click' a card from the left-hand array and then 'Click' the equivalent card from the right-hand array. Pairings can be validated using the 'Check' button. A correct pairing produces the message 'It's a match' and the corresponding cards disappear from the screen. When all cards are successfully paired a 'Match complete' message is displayed.

The 3 levels are differentiated by the fractions involved; some percentages at levels 2 and 3 include decimals (for example for the fraction 29/1000). At level 3 fractions over 125 are included and these usually give a decimal. A 'Replay' button allows the starter to be re-run using the same words.

Pupils should be encouraged to discuss the different strategies for finding matching pairs.

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SPIRE MATHS

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4 by 4 Grids

