

Y8 & Y9 Fraction, Decimal, Percentage and Ratio Starters

Smallest **Largest**

0.54 0.97 0.9 0.46 0.84

More Fraction, Decimal, Percentage and Ratio Interactive Starters

65% of 7.8 =

$7\frac{1}{4}$	$2\frac{5}{6}$	0.2×3	3.6	<input type="text"/>	$3.5 \div 5$
$\frac{59}{7}$	$\frac{30}{9}$	1.6	0.4×4	<input type="text"/>	5

What is the value of 0.1×5 ?

Calculate $\frac{4}{5}$ of 35?

Round 313 to the nearest 10

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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Decimal multiplication squares

OBJECTIVE(S): Multiply numbers and decimals.
DESCRIPTION: A number x a decimal. A '4 by 4 square' starter. Timer available. To speed it up click the grey cell without entering an answer.

Decimal multiplication squares

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

X				0.08
		✓		
10				

What is 0.08×10 ?

Answer = **Check**

Level **1**

Pen on

7 8 9
4 5 6
1 2 3
0 . (-)
n + -
Clear

Show timer
New
Reset

« »

Pupils can choose any one of 16 cells on a 4 by 4 grid. A question appears of the form 'What is a x b?' where one of a and b is an integer and the other is a decimal. Once the answer in a cell has been found colour coding is used to show whether the answer has 0, 1 or 2 decimal places. At the end the whole grid can be revealed.
Answers can be 'entered' in the blue cell and then checked. To speed up the process the original cell (which turns grey 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 16 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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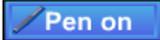
Decimal and number multiplication

OBJECTIVE(S): Use known facts to derive unknown facts, including products such as 0.7 and 6, and 0.03 and 8.

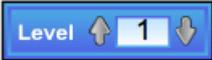
DESCRIPTION: An eighteen card matching challenge to pair simple multiplications of a number by a decimal with their solutions.

Decimal and number multiplication

Here are nine pairs of multiplication and their answers. You have 20 seconds to look at the cards before they are turned over. Click a multiplication and its answer to find all the matching pairs.



0.2 x 3	0.8 x 5	4 x 0.3	1.6	4	8.1
3.6	2 x 0.7	0.6 x 6	4 x 0.7	1.4	2 x 0.8
0.6	5 x 0.3	0.9 x 9	1.2	2.8	1.5







Nine pairs of simple multiplications of a number and a decimal with their solutions are presented on cards in a 3 by 6 array. The cards are shown face up for 20 seconds (level 1) and then turned over. Pupils are invited to click on cards in order to try and find matching pairs. If the questions and solutions correspond then the 'It's a match' message is shown and the cards disappear from the screen. If the selected cards do not correspond then a 'No match' message is shown. The same cards can be used again, but in different positions, by clicking Repeat.

The 3 levels are differentiated by the magnitude of the numbers involved in the questions and their solutions and the time available to see the cards before being turned over (20, 15 and 10 seconds at level 1, 2 and 3 respectively).

The timer can be used (it runs whether shown or hidden) to show the total time taken to find all nine matching pairs. It starts when the first card is clicked attempting to make a match.

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Improper fractions

OBJECTIVE(S): To convert improper fractions into mixed numbers and vice versa.
DESCRIPTION: An eighteen card matching challenge in which pupils are asked to pair an improper fraction with its corresponding mixed number.

Improper fractions

Here are nine pairs of matching fractions.
Click a fraction and its 'partner' to find all the matching the pairs.

$1\frac{5}{6}$	$8\frac{6}{7}$	$1\frac{2}{3}$	$\frac{23}{4}$	$7\frac{1}{5}$	$8\frac{4}{5}$
$\frac{11}{5}$	$5\frac{3}{4}$	$\frac{5}{3}$	$\frac{11}{6}$	$\frac{36}{5}$	$\frac{15}{2}$
$\frac{44}{5}$	$\frac{62}{7}$	$\frac{47}{6}$	$7\frac{1}{2}$	$2\frac{1}{5}$	$7\frac{5}{6}$

Level 1

Nine pairs of improper fractions and their corresponding mixed numbers are presented on cards (face shown) in a 3 by 6 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 timer can be used (it runs whether shown or hidden) to show the total time taken to find all nine matching pairs. The 3 levels are differentiated by the number of fractions and mixed numbers containing the same numerators.

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

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Ordering fractions

OBJECTIVE(S):

Put five fractions into ascending or descending order; recognise and use equivalent fractions.

DESCRIPTION:

Pupils are given five fractions that they have to place in numerical order. Compared by conversion to hundredths or thousandths.

Ordering fractions

Five fractions are shown below in yellow boxes. Drag them into the empty grey cells so that they finish in numerical order with the smallest on the left. You will be told when the order is correct.

Pen on

Smallest Largest

				
$\frac{2}{5}$	$\frac{9}{100}$	$\frac{71}{100}$	$\frac{1}{2}$	$\frac{7}{100}$

Level  1 

New
Reset

« »

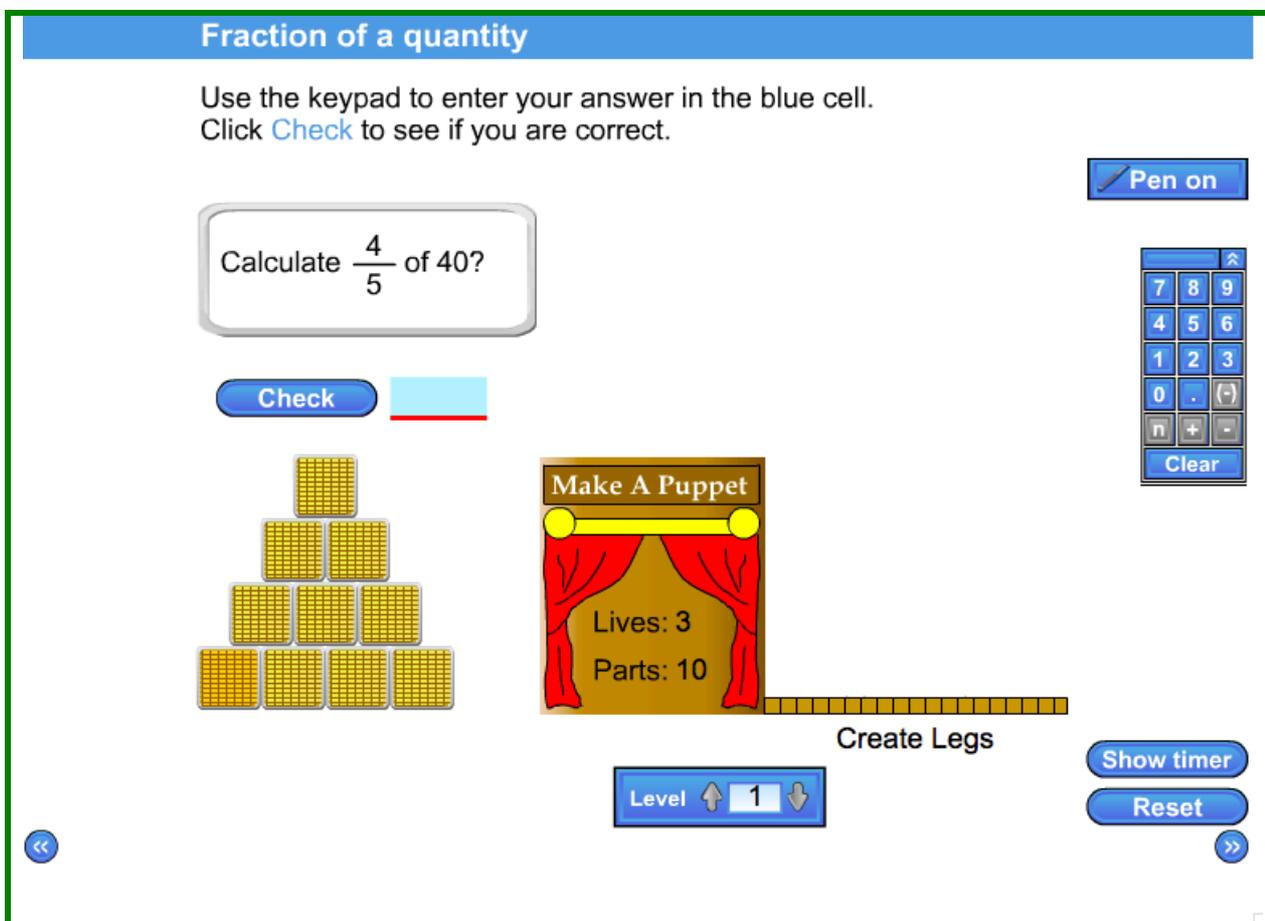
Five fractions are shown on screen and pupils are asked to put them in order from smallest to largest or largest to smallest. To do this pupils have to drag the fractions shown in yellow boxes into five grey cells. When the five fractions are placed in the grey cells pupils are told whether the fractions are in the correct order or not. In all cases fractions are between 0 and 1. Examples are randomly generated and all will test whether pupils can convert fractions to equivalent fractions. In some cases pupils will use common sense arguments to decide the order (or part of the order) without using equivalent fractions. There are 3 levels differentiated by the fractions used: at level one only halves, quarters, fifths, tenths and hundredths; at level two denominators include 20, 25 and 50; at level three denominators include those from earlier plus those with 3, 8 and 1000 as denominators.

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Fractions of a quantity

OBJECTIVE(S): Calculate fractions of quantities.
DESCRIPTION: Build a 'puppet' by answering ten addition/subtractions. Timer available. Click on the orange cell to save entering an answer.



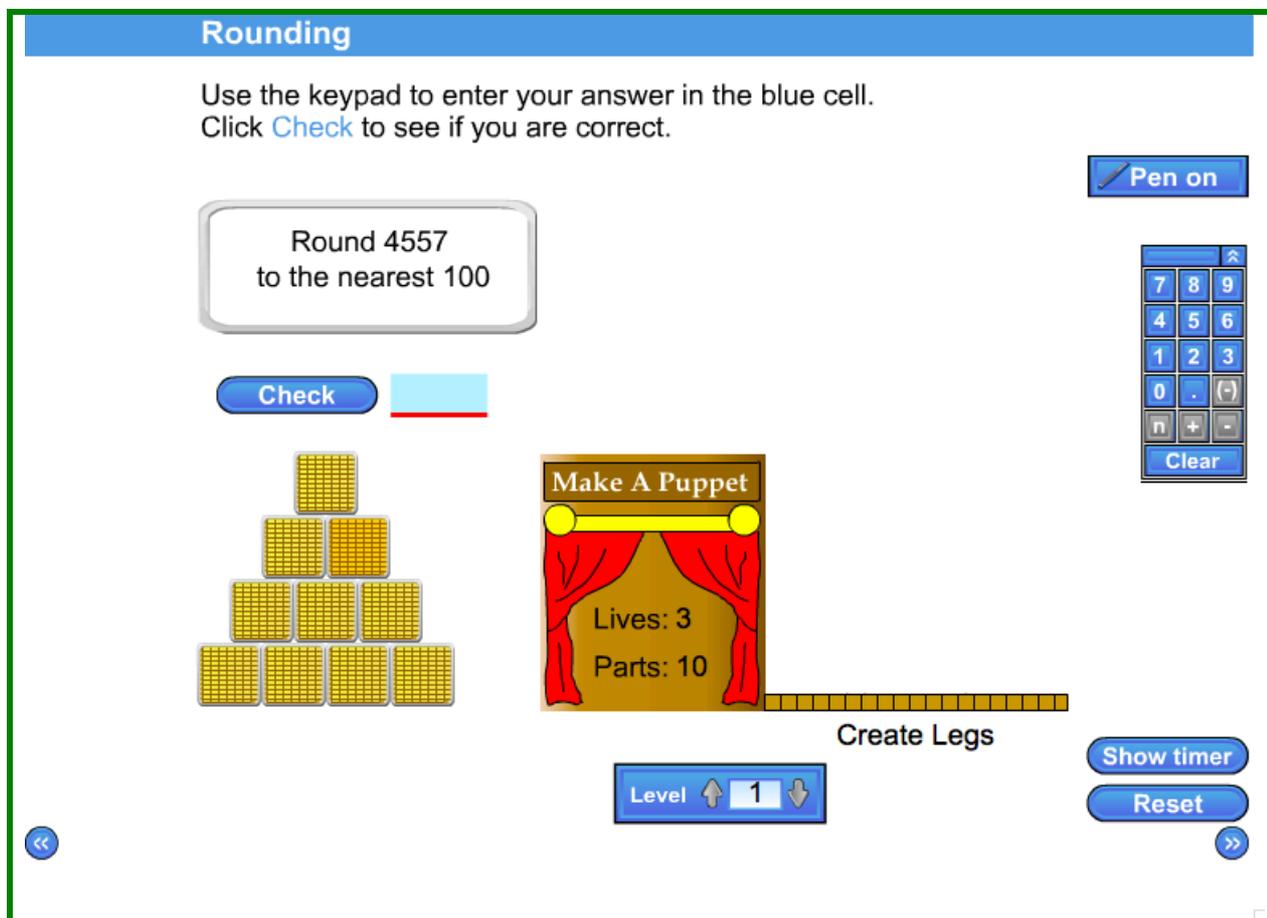
Ten yellow 'wicker baskets' are shown on the screen together with a 'mini-stage' and an instruction to click a 'wicker basket' for a question. Pupils can choose any one of the 10 wicker baskets. A question appears of the form a/b of c where one of a , b and c are integers. Answers can be 'entered' in the blue cell and then checked. To speed up the process the original 'wicker basket' (which turns orange on clicking) can be clicked again to signify a correct (oral) answer. Another 'wicker basket' can then be selected. The timer can be used to show the total time taken to answer all 10 questions (the timer works even when it is not visible). There are 3 levels differentiated by the fractions and numbers used.

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Rounding

OBJECTIVE(S): Round positive numbers to any given power of 10; round decimals to the nearest whole number or to one or two decimal places.
DESCRIPTION: Build a 'puppet' by answering ten rounding questions. Timer available. Click on the orange cell to save entering an answer.



Ten yellow 'wicker baskets' are shown on the screen together with a 'mini-stage' and an instruction to click a 'wicker basket' for a question. Pupils can choose any one of the 10 wicker baskets. A question appears of the form 'Round this number to the nearest integer, 10, 100, 1000, one or two decimal places. Answers can be 'entered' in the blue cell and then checked. To speed up the process the original 'wicker basket' (which turns orange on clicking) can be clicked again to signify a correct (oral) answer. Another 'wicker basket' can then be selected. The timer can be used to show the total time taken to answer all 10 questions (the timer works even when it is not visible). There are 3 levels differentiated by rounding: level one is to nearest integer, 10, 100 or 1000; level 2 includes to one decimal place and level three to two decimal places.

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

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Percentage of a quantity

OBJECTIVE(S): Calculate percentages of quantities.
DESCRIPTION: Pupils have to select 3 cards in order to make a true statement such as 10% of 20 = 2.

Percentage calculations

Click three numbers so that the mathematical statement at the top is true. Click **New** for a new pack of cards.

Pen on

of =

40%	20	25	70
10	50%	70%	35
49	28	8	50

Level 1

Score $\frac{0}{0}$

New
Reset

« »

A pack of twelve cards is shown on screen. Three cards show a percentage such as 30%, and the other nine show numbers. Pupils have to select three in order to make a true statement of the form a% of b = c. As a card is clicked it is entered into position in the order clicked and cannot be changed. You can usually make 6 to 8 statements with each pack. Click New for another pack of cards.
There are 3 levels differentiated by the percentage used and the size of the numbers.

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Decimal multiplication

OBJECTIVE(S): Consolidate and extend mental methods of calculation, working with decimals.

DESCRIPTION: Pupils have to select 3 cards in order to make a multiplication involving a number and one of 0.001, 0.01, 0.1, 10, 100 or 1000.

Decimal multiplication

Click three numbers so that the mathematical statement at the top is true. Click [New](#) for a new pack of cards.

$$\square \times \square = \square$$

10	0.01	100	0.056
9.3	78	5.6	93
0.033	0.33	0.1	0.78

Level 2

Score $\frac{0}{0}$

A pack of twelve cards is shown on screen. According to level, four cards show four of 10, 100, 1000, 0.1, 0.01 or 0.001. Pupils have to select three cards in order to make a true statement of the form $a \times b = c$. As a card is clicked it is entered into position in the order clicked and cannot be changed. You can usually make 10 to 12 statements with each pack. Note that $100 \times 0.1 = 10$ will be allowed. Click New for another pack of cards.

There are 3 levels differentiated by the choice of powers of 10 and the other eight cards.

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

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Decimal division

OBJECTIVE(S): Consolidate and extend mental methods of calculation, working with decimals.

DESCRIPTION: Pupils have to select 3 cards in order to make a division involving a number and one of 0.001, 0.01, 0.1, 10, 100 or 1000.

Decimal division

Click three numbers so that the mathematical statement at the top is true. Click [New](#) for a new pack of cards.

$$\square \div \square = \square$$

0.0079	0.21	100	0.87
21	1000	7.9	10
0.001	870	42	4.2

Level

Score $\frac{0}{0}$

A pack of twelve cards is shown on screen. According to level four cards show four of 10, 100, 1000, 0.1, 0.01 or 0.001. Pupils have to select three cards in order to make a true statement of the form $a \div b = c$. As a card is clicked it is entered into position in the order clicked and cannot be changed. You can usually make 10 to 12 statements with each pack. Note that $10 \div 0.1 = 100$ will be allowed. Click New for another pack of cards.

There are 3 levels differentiated by the choice of powers of 10 and the other eight cards.

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Ordering fractions and decimals

OBJECTIVE(S): Use equivalent fractions, lowest common multiple of fractions and convert fractions to decimals to compare five fractions/decimals.
DESCRIPTION: Three fractions and two decimals (or vice versa) to be placed in numerical order. Compared by conversion to hundredths/thousandths.

Ordering fractions and decimals

Five numbers are shown below in yellow boxes. Drag them into the empty grey cells so that they finish in numerical order with the largest on the left. You will be told when the order is correct.

Pen on

Largest Smallest

				
0.8	0.37	$\frac{3}{10}$	0.61	$\frac{27}{100}$

Level ↑ 1 ↓

New
Reset

« »

Three fractions and two decimals (or vice versa) are shown on screen and pupils are asked to put them in order from smallest to largest or largest to smallest. To do this pupils have to drag the fractions or decimals shown in yellow boxes into five grey cells. When the five are placed in the grey cells pupils are told whether they are in the correct order or not. In all cases fractions and decimals are between 0 and 1.

Examples are randomly generated and all will test whether pupils can convert appropriately. In some cases pupils will use common sense arguments to decide the order (or part of the order) without using equivalent fractions, or finding decimal equivalents of fractions.

There are 3 levels differentiated by the fractions or decimals used: at level one only halves, quarters, fifths, tenths and hundredths (or decimal equivalents); at level two denominators include 20, 25 and 50 (or decimal equivalents); at level three denominators include those from earlier plus those with 8 and 1000 as denominators (or decimal equivalents).

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Fractions, decimals and percentages

OBJECTIVE(S): Understand the equivalence of fractions, decimals and percentages.
DESCRIPTION: Pupils have to select 3 cards, in any order, that are the same, one fraction, one decimal and one percentage.

Fractions, decimals and percentages

Click one fraction, one decimal and one percentage that are all equal.

Pen on

= =

84%	$\frac{31}{40}$	0.575	25%
$\frac{21}{25}$	0.84	0.85	$\frac{1}{25}$
0.25	$\frac{23}{40}$	57.5%	5%

Level 3

Score $\frac{0}{0}$

New
Reset

« »

A pack of twelve cards is shown on screen. Four are fractions, four decimals and four percentages. You have to click any three that are the same; usually there will be two, three or four triples.
There are 3 levels differentiated by the fractions, decimals and percentages used.

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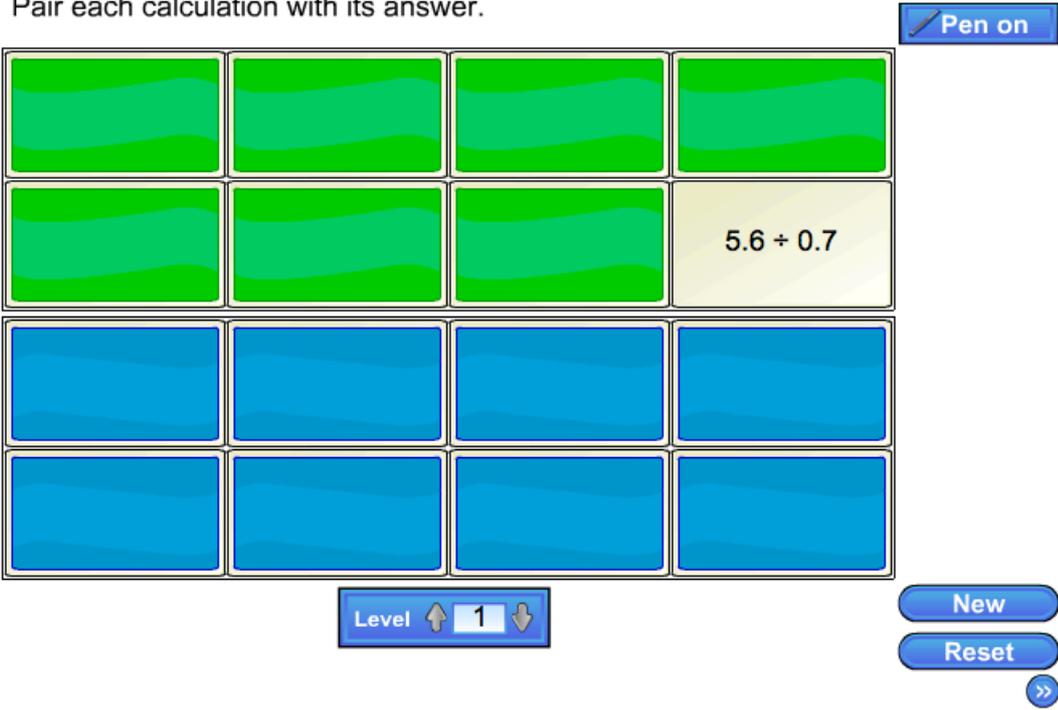
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Mental arithmetic (decimals)

OBJECTIVE(S): Multiply and divide simple decimals.
DESCRIPTION: An '8 pair card matching' starter to match simple decimal calculations with answers. The 3 levels are differentiated by numbers used.

Mental arithmetic (decimals)

Each green card at the top shows a calculation.
Each blue card at the bottom shows an answer to a calculation.
Pair each calculation with its answer.



Pen on

5.6 ÷ 0.7

Level ↑ 1 ↓

New

Reset

« »

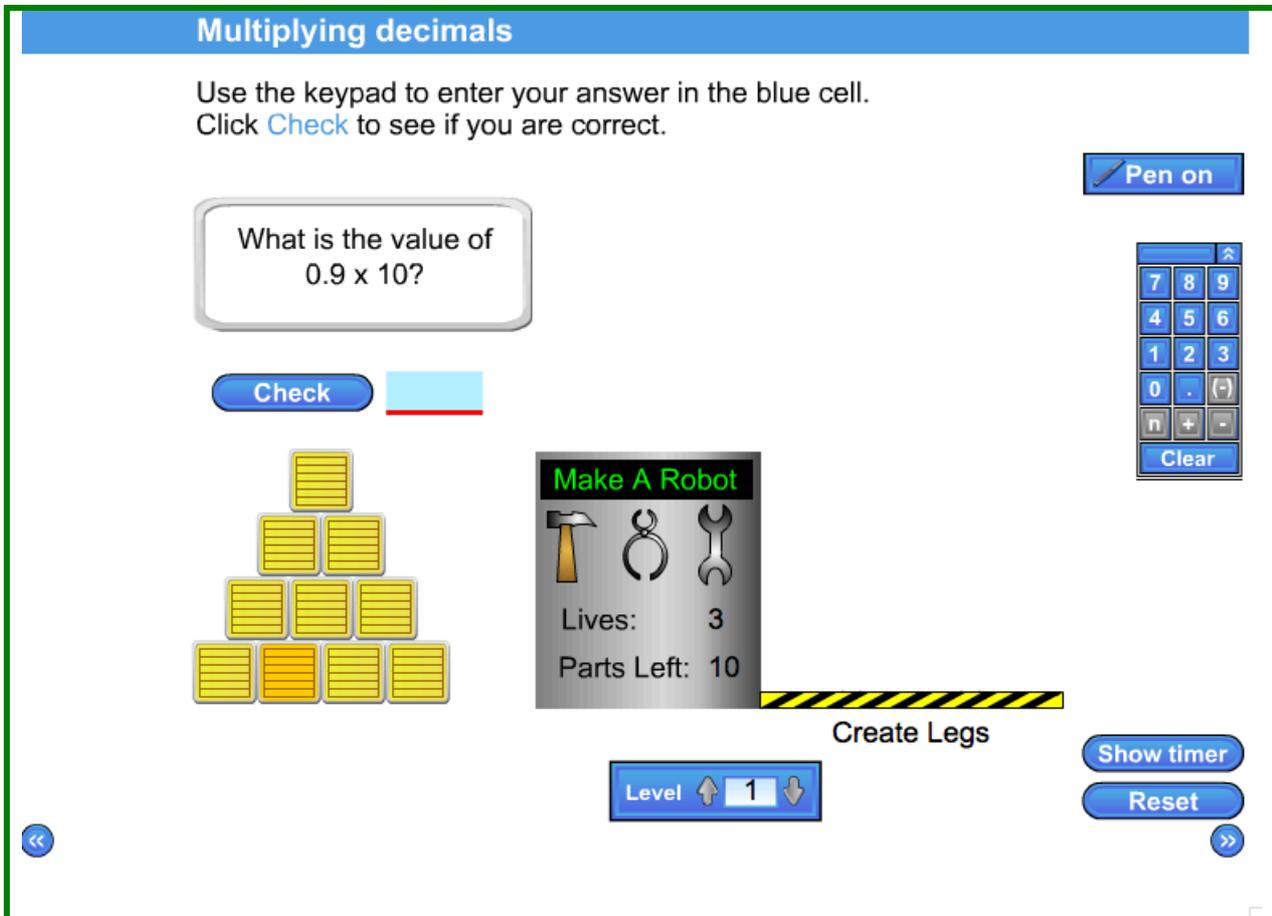
Eight pairs of matching cards, in two 2 by 4 arrays, are shown with faces hidden. Pupils are invited to 'Click' a card from the top array to turn it and reveal a simple multiplication or division of decimals. The aim is to 'Click' a card from the bottom array to turn it and reveal the answer. Pairings 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 numbers involved.

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Multiplying decimals

OBJECTIVE(S): Multiply decimals by 0.1, 0.01 and by decimals such as 0.6 or 0.06.
DESCRIPTION: Build a 'robot' by answering ten random decimal multiplications. Timer available.
Click on the orange cell to save entering an answer.



Ten yellow 'crates' are shown on the screen together with a 'factory' bench and an instruction to click a 'crate' for a question. Pupils can choose any one of the 10 crates. A question appears of the form $a \times b$ where one of a or b will be a decimal like 0.1, 0.01, 0.3 or 0.03 and the other a number/decimal depending on the level chosen.

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

The timer can be used to show the total time taken to answer all 10 questions (the timer works even when it is not visible).

There are 3 levels differentiated by the numbers used.

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Assorted number questions: 0 and X

OBJECTIVE(S):	Recall known facts concerning numbers including decimals, fractions and percentages.
DESCRIPTION:	A noughts and crosses game for two teams. Answer decimal, fraction and percentage questions.

Assorted number questions: 0 and X

Use the keypad to enter your answer in the blue cell.
Click [Check](#) to see if you are correct.

Pen on

What is $\frac{25}{40}$ as a fraction in its lowest terms?

Check

Keypad:
7 8 9
4 5 6
1 2 3
0 . (-)
n + -
Clear

Score
O = 0
X = 0

New
Reset

Level 1

◀ ▶

A noughts and crosses board is shown. One team is noughts, the other crosses. Pupils select a square and are then taken to a question. If they get the question right, they get the nought or cross, if not their go is complete. The winning team needs a row of three of their symbol (as in the standard game). Scores are shown on a scoreboard, which keeps a record of wins until a level is changed or Reset is clicked. Here fraction, decimal and percentage questions are asked and pupils have to put the answer into a blue cell using the keypad. There are 3 levels differentiated by the numbers used.

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

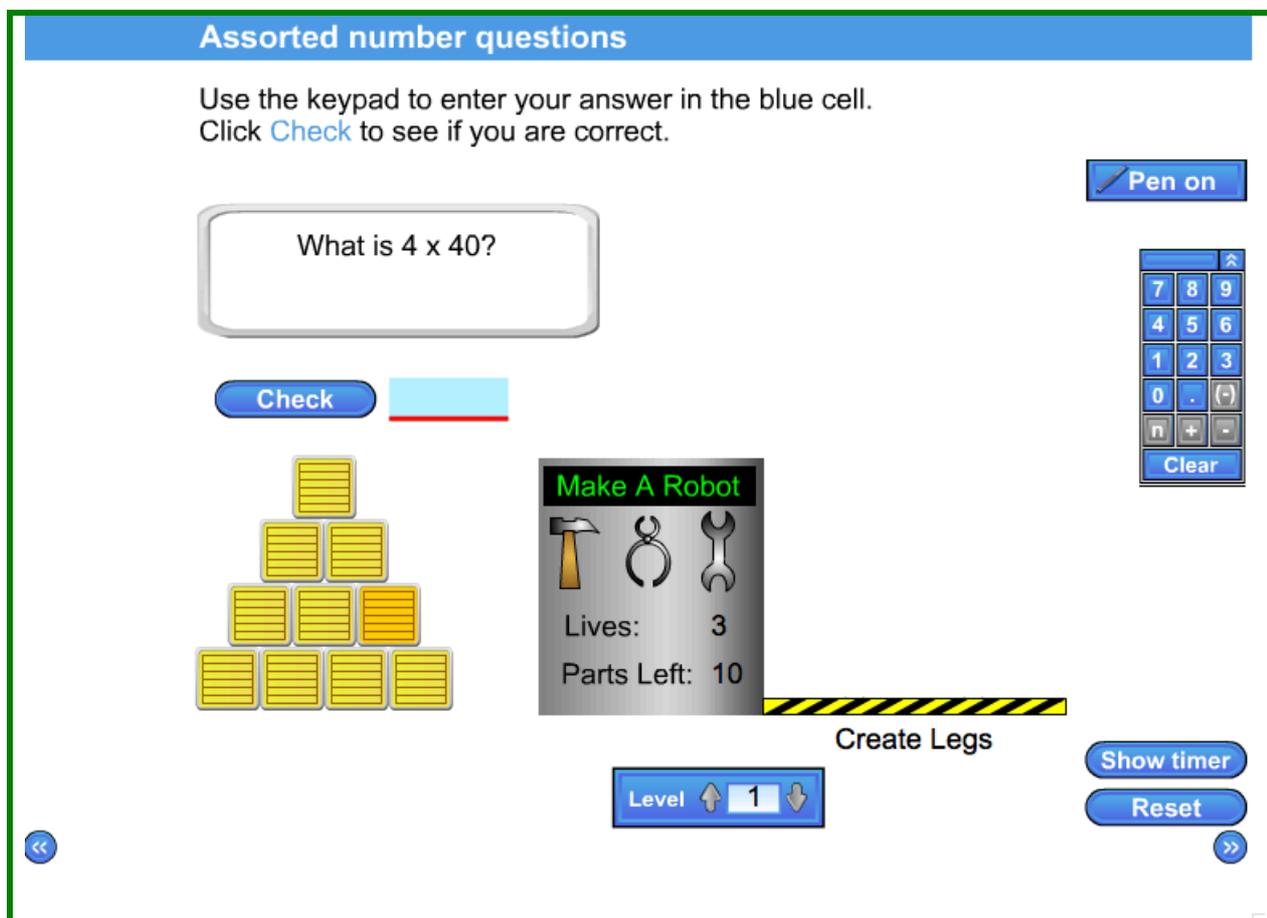
Unfortunately they will not work on iPads or iPhones.

Assorted number questions

OBJECTIVE(S): Recall known facts concerning numbers including decimals, fractions and percentages.

DESCRIPTION: Build a 'puppet' by answering ten fractions, decimals and percentages questions. Timer available.

Click on the orange cell to save entering an answer.



Ten yellow 'wicker baskets' are shown on the screen together with a 'mini-stage' and an instruction to click a 'wicker basket' for a question. Pupils can choose any one of the 10 wicker baskets. One of ten question types appears based around fractions, decimals and percentages.

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

The timer can be used to show the total time taken to answer all 10 questions (the timer works even when it is not visible).

There are 3 levels differentiated by the numbers used.

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