

Y6 & Y7 Algebra Starters

Algebra Interactive Starters

2, 4, 6, 8, 10

19

$3n$	n	$2x$	$10x$	$7x$
$7n - 4n$	$4n + 3n$	$7n - 3n$	$7n$	$6x$
$x + x$	$10n - 4n$	$4n - 3n$	$6n$	$9n - 7n$
$2x + 8x$	$3x + 3x$	$2n$	$3x + 4x$	$4n$

Solve the equation in a: $102 = a + 30$

$2(n + 4)$ when $n = 5$ 16

$7n - 5$ when $n = 7$ 44

$8(n - 2)$ when $n = 7$ 38

$9n + 9$ when $n = 7$ -9

$3(n - 6)$ when $n = 3$ 18

$4(n + 2)$ when $n = 2$ 72

$6n - 6$ when $n = 7$ 36

$9n + 2$ when $n = 4$ 40

Score: 4

26n

7n 3n

Spire Maths Interactives

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

There are 9 Algebra Interactives: 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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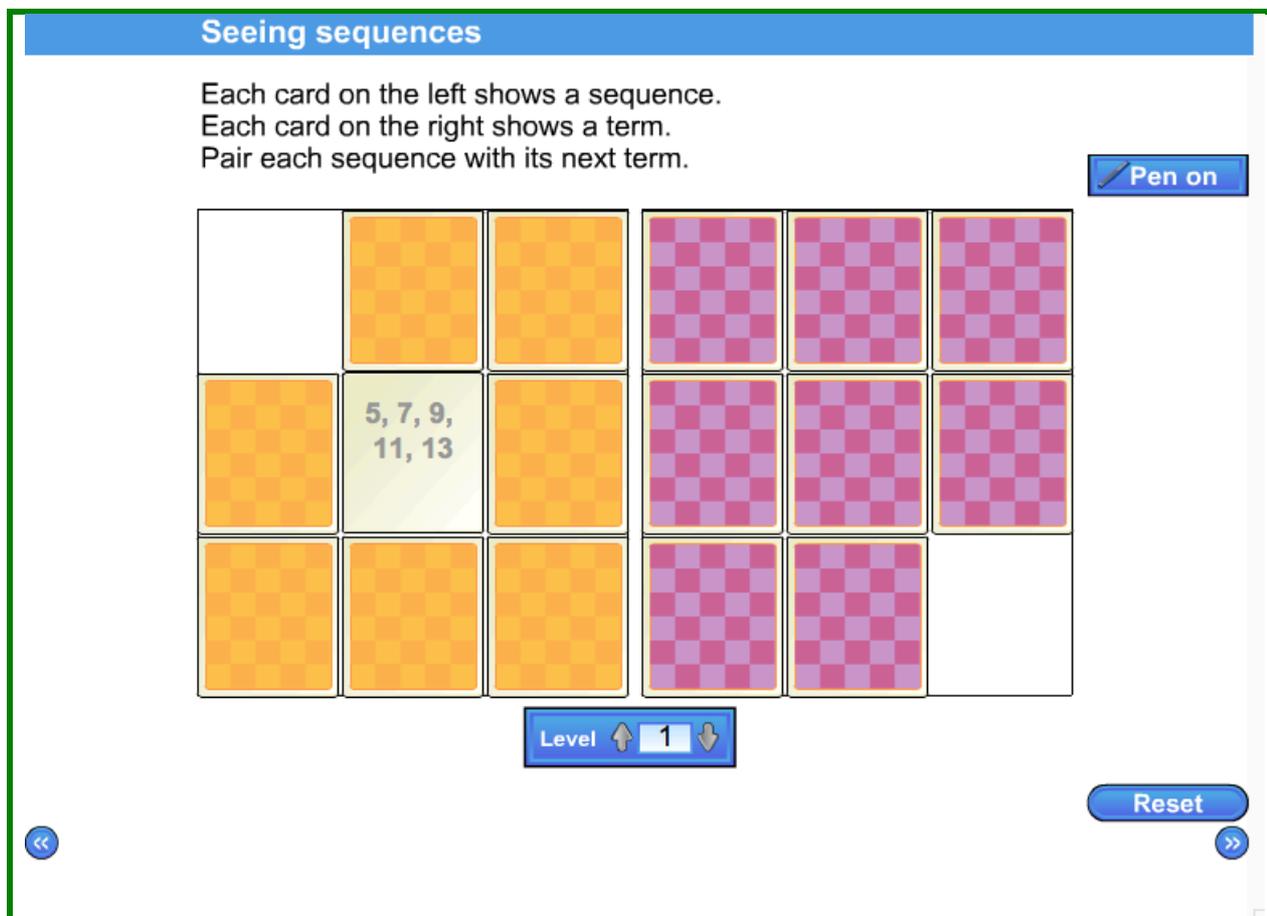
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Seeing sequences

OBJECTIVE(S): Finding a term in a sequence given its position in the sequence.

DESCRIPTION: Pupils have to find a given term of a sequence when the first five terms can be seen (3 levels). A '9 pair card matching' starter where pupils have to pair items that are initially hidden.



Two sets of 3 by 3 cards are shown on the screen, but the contents are hidden. You can select one card from each side. When you believe that the cards match you should click Check and the computer will respond according to whether a pair is found or not.

If Check is not used, a click on a card will turn it over.

The left-hand side shows the first 5 terms of a sequence, the right-hand side the next, seventh or nth term according to the level (1, 2 and 3 respectively).

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

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Counting on

OBJECTIVE(S): Count on and back in steps of 0.1, 0.2, 0.25, etc.

DESCRIPTION: Pupils are given the first 5 terms of 8 sequences and 8 next terms (3 levels available). An '8 pair match and move starter' where pupils have to move the next term to the correct place (next to the appropriate sequence).

Counting on

On the left are the first five terms of eight sequences.
On the right are the next terms all jumbled up. Move each of the eight numbers on the right into its correct grey cell.

0.5, 1, 1.5, 2, 2.5		1.1
0.35, 0.25, 0.15, 0.05, -0.05		2.15
0.8, 0.3, -0.2, -0.7, -1.2		
0.75, 0.85, 0.95, 1.05, 1.15		-1.7
0.3, 0.1, -0.1, -0.3, -0.5		-0.7
0.6, 0.3, 0, -0.3, -0.6	-0.9	1.25
0.9, 1.15, 1.4, 1.65, 1.9		-0.15
0.1, 0.3, 0.5, 0.7, 0.9		3

Level ↑ 1 ↓

Check

New

Hide timer

Reset

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0 : 31

Pen on

Pupils are given the first 5 terms of 8 sequences and 8 next terms. They have to move the next term to the correct place (next to the appropriate sequence). Answers can be checked one at a time or all at the end.

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

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Matching functions

OBJECTIVE(S): Know addition and subtraction facts to 20; recall multiplication facts to 10 x 10; find the output for a given function for a given input.

DESCRIPTION: Pupils are shown 9 functions created of two 'function machines' and an input value. They have to match this with one of 9 output values which can be seen on the screen. A '9 pair card matching' starter with 3 levels (differentiated by number size).

Matching functions

The card on the left shows an input value and a function.
The card on the right shows an output value.
Match each card on the left with the correct card on the right.

$\begin{array}{c} 5 \\ \downarrow \\ \boxed{\times 7} \rightarrow \boxed{+ 8} \\ \downarrow \\ ? \end{array}$	$\begin{array}{c} 2 \\ \downarrow \\ \boxed{\times 6} \rightarrow \boxed{+ 7} \\ \downarrow \\ ? \end{array}$	$\begin{array}{c} 1 \\ \downarrow \\ \boxed{\times 6} \rightarrow \boxed{- 3} \\ \downarrow \\ ? \end{array}$	43	108	4
$\begin{array}{c} 6 \\ \downarrow \\ \boxed{\times 3} \rightarrow \boxed{- 7} \\ \downarrow \\ ? \end{array}$	$\begin{array}{c} 6 \\ \downarrow \\ \boxed{+ 6} \rightarrow \boxed{\times 7} \\ \downarrow \\ ? \end{array}$	49	19	11	84
$\begin{array}{c} 2 \\ \downarrow \\ \boxed{\times 4} \rightarrow \boxed{- 4} \\ \downarrow \\ ? \end{array}$	$\begin{array}{c} 5 \\ \downarrow \\ \boxed{+ 7} \rightarrow \boxed{\times 9} \\ \downarrow \\ ? \end{array}$	$\begin{array}{c} 2 \\ \downarrow \\ \boxed{+ 5} \rightarrow \boxed{\times 7} \\ \downarrow \\ ? \end{array}$	3		

Pen on

New

Replay

Reset

Level ↑ 1 ↓

<<
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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 an input value and a function, the right-hand side shows the matching output values. 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 number size.

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

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Evaluating a term

OBJECTIVE(S): Substitute positive integers into simple linear expressions

DESCRIPTION: A 'matching' starter where you are asked to pair eight linear expressions in one variable (which is given) with corresponding numeric values using 'drag and drop'. Timer available. There are 3 levels.

Evaluating a term

You are given an n th term and a value for n for some sequences below. Find the output for each of these. Drag and drop each of the eight numbers on the right into the correct grey cell.

0 : 24
Pen on

$5(n + 6)$ when $n = 4$	50	25
$5(n - 8)$ when $n = 7$		-8
$4(n + 6)$ when $n = 5$		14
$7n - 3$ when $n = 4$		44
$4n + 6$ when $n = 2$		33
$4(n - 8)$ when $n = 6$		35
$4n + 7$ when $n = 7$		
$7n - 2$ when $n = 5$		-5

Level \uparrow 1 \downarrow Check

New
Hide timer
Reset

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Eight linear expressions for the n th term of sequences and values for n are given on one side of the screen. On the other side of the screen are eight corresponding numeric values for the various n th terms arranged in a different order. Using 'drag and drop' you are invited to match the n th terms with their corresponding numeric values, placing the numbers into grey cells adjacent to the expressions.

It is possible to click 'Check' at any time. When all eight responses are correct a 'Well done' message is displayed.

The timer can be used (it runs whether shown or hidden) to show the total time taken to place all eight numbers correctly.

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Matching expressions

OBJECTIVE(S): Understand that algebraic operations follow the same conventions and order as arithmetic operations.

DESCRIPTION: A twenty card matching challenge in which pupils are asked to pair equivalent linear expressions. The 3 levels are differentiated. At level 1 equivalent expressions are in their lowest terms. At level 2 some are at level 3 very few are.

Matching expressions

Click on the equivalent expression.

Pen on

$10n$	$x + 9x$	$9n$	$4x - 2x$	$5x + x$
$10n - 6n$	$6n + 3n$	$6x$		$5n$
$4n$	$6n + 4n$	$10x$	$9n - n$	$2n$
$8n$	$4n + n$		$2x$	$6n - 4n$

Level \uparrow 1 \downarrow

New
Repeat
Show timer
Reset

\ll \gg

Ten pairs of equivalent expressions 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 expressions. If the expressions 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. At level 1 equivalent expressions are in their lowest terms. At level 2 some are at level 3 very few are.

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

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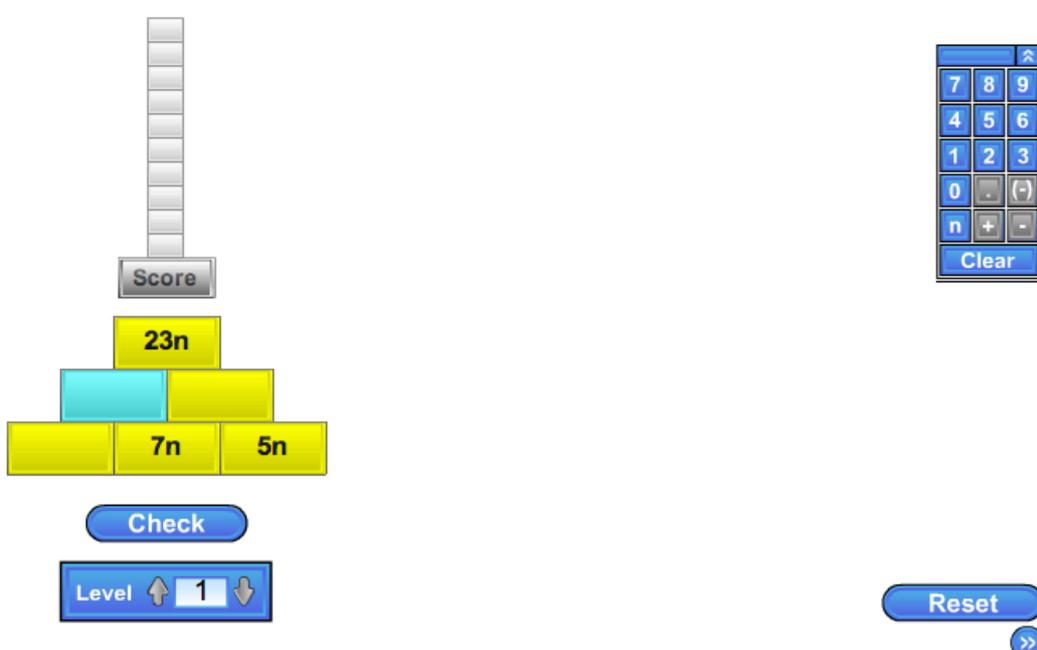
Pyramid numbers

OBJECTIVE(S): Add and subtract positive integers in context; understand that algebraic operations follow the same conventions and order as arithmetic operations.

DESCRIPTION: A (6 -cell) pyramid starter in which pupils are asked to calculate the value in a cell given a value in three other cell using a keypad for number entry.

Pyramid numbers

As you go up the pyramid, each brick is the sum of the two bricks that it is standing on. Type the missing number into the empty blue cell then click **Check**.



A six cell (1 + 2 + 3) pyramid is presented in which the values in three or four cells are given and one cell is highlighted in blue. Pupils are invited to calculate the value in the highlighted cell and enter their answer using the keypad for entry. Answers can be confirmed or otherwise by use of the 'Check' button. A correct answer produces the message 'Correct' and a 10 point 'Thermometer Scale' advances one level.

The 3 levels are differentiated by the magnitude of the values involved and the number and distribution within the pyramid of the given cells.

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.

Early difficulties with elementary algebra can be noted and followed up at a later stage.

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Solving simple equations

OBJECTIVE(S): Solve simple equations with integers; consolidate mental methods of calculation.

DESCRIPTION: A '4 by 4 square' starter where pupils have to solve sixteen random equations.

Simple equations

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

Solve the equation in a: $124 - a = 37$

Answer = Level 1

7	8	9	↑
4	5	6	
1	2	3	
0	.	(-)	
n	+	-	
<input type="button" value="Clear"/>			

Pupils can choose any one of sixteen cells on a 4 by 4 grid. A question appears of the form 'Solve the equation in x: $a = x + b$ where a and b vary'. The position of the x can also vary, but it is always x , never $2x$. There are three levels differentiated by numbers used.

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).

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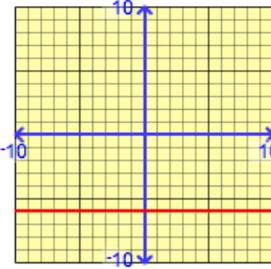
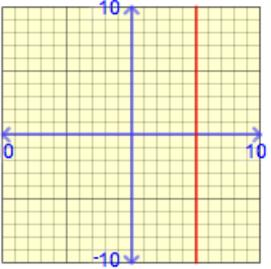
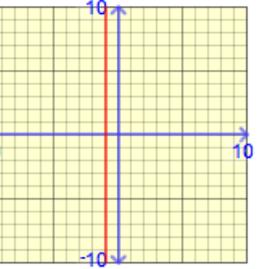
Matching graphs 1

OBJECTIVE(S): Construct and recognise equations of simple linear graphs both parallel to and not parallel to the axes.

DESCRIPTION: A starter in which pupils have to match simple straight line graphs drawn on a grid with equations given in an array.

Matching graphs 1

Click the correct equation for this graph BUT only when the equation is coloured PURPLE.

Pen on

$y = 1$	$y = 6$	$y = -1$	$x = -6$	$y = -6$	$y = -5$
$x = -5$	$x = 5$	$x = -1$	$x = 1$	$y = 5$	$x = 6$

Level ↑ 1 ↓

New

Show timer

Reset

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⏩

Three grids, with axes of variable lengths, are presented. On each grid a simple straight line graph (parallel to the axes or diagonal through the origin) is superimposed. Below the grids are twelve cells containing suggested equations for the graphs. Pupils are invited to highlight each grid in turn and determine the equation of the line on the selected grid. They are then asked to click on the cells containing matching equations. (The cells can be clicked only when highlighted with a stated colour.) A correct match prompts the message 'Graph correct.' and the cell disappears, otherwise 'Oops. Try again.'. When the equation has been correctly identified a 'tick' appears on the grid. When all lines have been solved the message 'All correct. Well done.' appears.

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Matching graphs 2

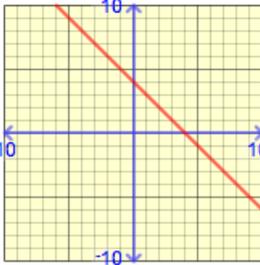
OBJECTIVE(S): Construct and recognise equations of simple linear graphs not parallel to the axes and not passing through the origin.

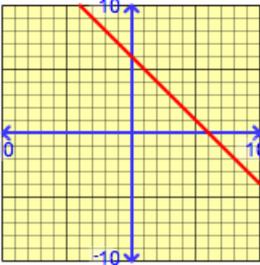
DESCRIPTION: A starter in which pupils have to match simple straight line graphs drawn on a grid with equations given in an array.

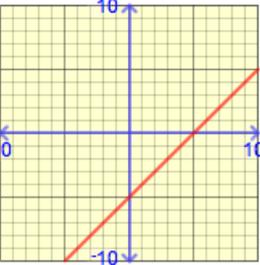
Matching graphs 2

Click the correct equation for this graph BUT only when the equation is coloured BLUE.

Pen on







y=4-x	y=5-x	y=x+5	y=x-5	y=x-4	y=-x-5
y=-x-4	y=x-6	y=6-x	y=x+6	y=x+4	y=-x-6

Level
↑
1
↓

New
Show timer
Reset

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Three grids, with axes of variable lengths, are presented. On each grid a simple straight line graph (neither parallel to the axes nor necessarily through the origin) is superimposed. Below the grids are twelve cells containing suggested equations for the graphs. Pupils are invited to highlight each grid in turn and determine the equation of the line on the selected grid. They are then asked to click on the cells containing matching equations. (The cells can be clicked only when highlighted with a stated colour.) A correct match prompts the message 'Graph correct.' and the cell disappears, otherwise 'Oops. Try again.'. When the equation has been correctly identified, a 'tick' appears on the grid. When all lines have been solved the message 'All correct. Well done.' appears.

There are 3 levels differentiated by the line orientation and the range on the axes. The timer can be used (it runs whether shown or hidden) to show the total time taken.

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4 by 4 Grids

