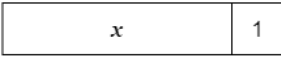

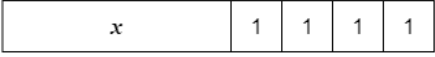
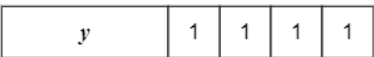
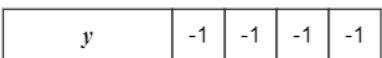
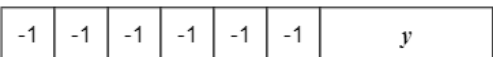




# Language of Algebra

## Using Algebra Tiles

- 1 The table below shows an algebraic expression either given in words, using a diagram or as an expression. Complete the table.

	Written Meaning	Pictorial Representation	Algebraic Expression
Example	"One more than $x$ "		$x + 1$
a)	"Two more than $x$ "		
b)			$x + 4$
c)			$y + 4$
d)	"Four less than $y$ "		
e)	" $y$ more than four"		$4 + y$
f)			$6 + y$
g)	" $y$ more than negative six"		
h)	"Six less than $y$ "		
i)	What do you notice about your answers to parts g) and h)?		
j)	Give two other ways you write the expression $x + 4$ .		

2 The table below shows an algebraic expression either given in words, using a diagram or as an expression. Complete the table.

	Written Meaning	Pictorial Representation	Algebraic Expression			
Example	"Two lots of x"	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>x</td></tr> <tr><td>x</td></tr> </table>	x	x	2x	
x						
x						
a)	"Three lots of x"					
b)		<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>y</td></tr> <tr><td>y</td></tr> <tr><td>y</td></tr> </table>	y	y	y	
y						
y						
y						
c)		<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>-y</td></tr> <tr><td>-y</td></tr> <tr><td>-y</td></tr> </table>	-y	-y	-y	
-y						
-y						
-y						
d)	"Six lots of negative y"					

3 The table below shows an algebraic expression either given in words, using a diagram or as an expression. Complete the table.

	Written Meaning	Pictorial Representation	Algebraic Expression			
Example	"Two lots of x then plus one"	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>x</td></tr> <tr><td>x</td></tr> </table> <table border="1" style="display: inline-table; vertical-align: middle; margin-left: 10px;"> <tr><td>1</td></tr> </table>	x	x	1	2x + 1
x						
x						
1						
a)	"Two lots of x then plus three"					
b)	"Two lots of x then plus four"					
c)	"Three lots of x then plus four"					

d)		<table border="1"> <tbody> <tr> <td><math>x</math></td> <td>1</td> </tr> <tr> <td><math>x</math></td> <td>1</td> </tr> <tr> <td><math>x</math></td> <td>1</td> </tr> <tr> <td></td> <td>1</td> </tr> </tbody> </table>	$x$	1	$x$	1	$x$	1		1	
$x$	1										
$x$	1										
$x$	1										
	1										
e)	"The total of three times $x$ . then plus negative four"										
f)		<table border="1"> <tbody> <tr> <td><math>y</math></td> <td>-1</td> </tr> <tr> <td><math>y</math></td> <td>-1</td> </tr> <tr> <td><math>y</math></td> <td>-1</td> </tr> <tr> <td></td> <td>-1</td> </tr> </tbody> </table>	$y$	-1	$y$	-1	$y$	-1		-1	
$y$	-1										
$y$	-1										
$y$	-1										
	-1										
g)		<table border="1"> <tbody> <tr> <td><math>-y</math></td> <td>-1</td> </tr> <tr> <td><math>-y</math></td> <td>-1</td> </tr> <tr> <td><math>-y</math></td> <td>-1</td> </tr> <tr> <td></td> <td>-1</td> </tr> </tbody> </table>	$-y$	-1	$-y$	-1	$-y$	-1		-1	$-3y - 4$
$-y$	-1										
$-y$	-1										
$-y$	-1										
	-1										
h)	"Three lots of negative $y$ . then subtract four"	<table border="1"> <tbody> <tr> <td><math>-y</math></td> <td>-1</td> </tr> <tr> <td><math>-y</math></td> <td>-1</td> </tr> <tr> <td><math>-y</math></td> <td>-1</td> </tr> <tr> <td></td> <td>-1</td> </tr> </tbody> </table>	$-y$	-1	$-y$	-1	$-y$	-1		-1	$-3y - 4$
$-y$	-1										
$-y$	-1										
$-y$	-1										
	-1										
i)	"Three lots of all of $x$ plus one"	<table border="1"> <tbody> <tr> <td><math>x</math></td> <td>1</td> </tr> <tr> <td><math>x</math></td> <td>1</td> </tr> <tr> <td><math>x</math></td> <td>1</td> </tr> </tbody> </table>	$x$	1	$x$	1	$x$	1			
$x$	1										
$x$	1										
$x$	1										
j)	"Four lots of all of $x$ plus one"		$4(x + 1)$ OR $4x + 4$								
k)	"Four lots of all of $y$ plus one"										
l)			$4(y - 1)$ OR $4y - 4$								
m)	"Four lots of all of double $y$ subtract one"										

4 The table below shows an algebraic expression either given in words, using a diagram or as an expression. Complete the table.

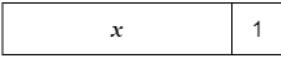

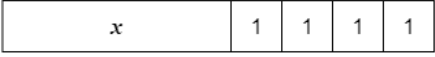


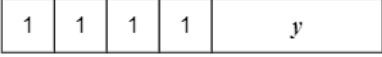
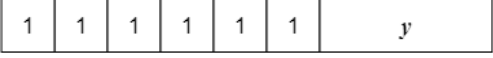
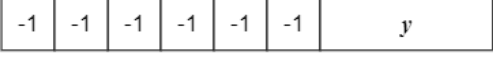

	Written Meaning	Pictorial Representation	Algebraic Expression												
a)	"The total of x and y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center; width: 40px;">x</td><td style="text-align: center; width: 40px;">y</td></tr></table>	x	y											
x	y														
b)	"The total of y and x"														
c)	"x subtract y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center; width: 40px;">x</td><td style="text-align: center; width: 40px;">-y</td></tr></table>	x	-y											
x	-y														
d)		<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center; width: 40px;">y</td><td style="text-align: center; width: 40px;">-x</td></tr></table>	y	-x											
y	-x														
e)	"x subtract two lots of y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center; width: 40px;">x</td><td style="text-align: center; width: 40px;">-y</td></tr><tr><td></td><td style="text-align: center;">-y</td></tr></table>	x	-y		-y									
x	-y														
	-y														
f)			$x - 3y$												
g)	"x subtract three lots of y. then plus four"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center; width: 40px;">x</td><td style="text-align: center; width: 40px;">-y</td><td style="text-align: center; width: 20px;">1</td></tr><tr><td></td><td style="text-align: center;">-y</td><td style="text-align: center;">1</td></tr><tr><td></td><td style="text-align: center;">-y</td><td style="text-align: center;">1</td></tr><tr><td></td><td></td><td style="text-align: center;">1</td></tr></table>	x	-y	1		-y	1		-y	1			1	
x	-y	1													
	-y	1													
	-y	1													
		1													
h)	"x subtract two lots of y. then plus four"		$x - 2y + 4$												
i)	"x subtract two lots of y. plus two"														
j)	Explain why the x term and the numerical term are either positive or negative in part i)														



# Language of Algebra ANSWERS

## Using Algebra Tiles

- 1 The table below shows an algebraic expression either given in words, using a diagram or as an expression. Complete the table.

	Written Meaning	Pictorial Representation	Algebraic Expression
Example	"One more than $x$ "		$x + 1$
a)	"Two more than $x$ "		$x + 2$
b)	"Four more than $x$ "		$x + 4$
c)	"Four more than $y$ "		$y + 4$
d)	"Four less than $y$ "		$y - 4$
e)	" $y$ more than four"		$4 + y$
f)	" $y$ more than six"		$6 + y$
g)	" $y$ more than negative six"		$-6 + y$
h)	"Six less than $y$ "		$y - 6$
i)	What do you notice about your answers to parts g) and h)?		
j)	Give two other ways you write the expression $x + 4$ ?		

2 The table below shows an algebraic expression either given in words, using a diagram or as an expression. Complete the table.

	Written Meaning	Pictorial Representation	Algebraic Expression						
Example	"Two lots of x"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td></tr><tr><td style="text-align: center;">x</td></tr></table>	x	x	$2x$				
x									
x									
a)	"Three lots of x"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td></tr><tr><td style="text-align: center;">x</td></tr><tr><td style="text-align: center;">x</td></tr></table>	x	x	x	$3x$			
x									
x									
x									
b)	"Three lots of y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">y</td></tr><tr><td style="text-align: center;">y</td></tr><tr><td style="text-align: center;">y</td></tr></table>	y	y	y	$3y$			
y									
y									
y									
c)	"Three lots of negative y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">-y</td></tr><tr><td style="text-align: center;">-y</td></tr><tr><td style="text-align: center;">-y</td></tr></table>	-y	-y	-y	$-3y$			
-y									
-y									
-y									
d)	"Six lots of negative y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">-y</td><td style="text-align: center;">-y</td></tr><tr><td style="text-align: center;">-y</td><td style="text-align: center;">-y</td></tr><tr><td style="text-align: center;">-y</td><td style="text-align: center;">-y</td></tr></table>	-y	-y	-y	-y	-y	-y	$-6y$
-y	-y								
-y	-y								
-y	-y								

3 The table below shows an algebraic expression either given in words, using a diagram or as an expression. Complete the table.

	Written Meaning	Pictorial Representation	Algebraic Expression							
Example	"Two lots of x then plus one"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td></tr><tr><td style="text-align: center;">x</td></tr></table> <table border="1" style="display: inline-table; vertical-align: middle; margin-left: 10px;"><tr><td style="text-align: center;">1</td></tr></table>	x	x	1	$2x + 1$				
x										
x										
1										
a)	"Two lots of x then plus three"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td></tr><tr><td style="text-align: center;">x</td></tr></table> <table border="1" style="display: inline-table; vertical-align: middle; margin-left: 10px;"><tr><td style="text-align: center;">1</td></tr><tr><td style="text-align: center;">1</td></tr><tr><td style="text-align: center;">1</td></tr></table>	x	x	1	1	1	$2x + 3$		
x										
x										
1										
1										
1										
b)	"Two lots of x then plus four"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td></tr><tr><td style="text-align: center;">x</td></tr></table> <table border="1" style="display: inline-table; vertical-align: middle; margin-left: 10px;"><tr><td style="text-align: center;">1</td></tr><tr><td style="text-align: center;">1</td></tr><tr><td style="text-align: center;">1</td></tr><tr><td style="text-align: center;">1</td></tr></table>	x	x	1	1	1	1	$2x + 4$	
x										
x										
1										
1										
1										
1										
c)	"Three lots of x then plus four"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td></tr><tr><td style="text-align: center;">x</td></tr><tr><td style="text-align: center;">x</td></tr></table> <table border="1" style="display: inline-table; vertical-align: middle; margin-left: 10px;"><tr><td style="text-align: center;">1</td></tr><tr><td style="text-align: center;">1</td></tr><tr><td style="text-align: center;">1</td></tr><tr><td style="text-align: center;">1</td></tr></table>	x	x	x	1	1	1	1	$3x + 4$
x										
x										
x										
1										
1										
1										
1										

d)	"The total of three times x. then plus four"	<table border="1"> <tr><td>x</td><td>1</td></tr> <tr><td>x</td><td>1</td></tr> <tr><td>x</td><td>1</td></tr> <tr><td></td><td>1</td></tr> </table>	x	1	x	1	x	1		1	$3x + 4$				
x	1														
x	1														
x	1														
	1														
e)	"The total of three times x. then plus negative four"	<table border="1"> <tr><td>x</td><td>-1</td></tr> <tr><td>x</td><td>-1</td></tr> <tr><td>x</td><td>-1</td></tr> <tr><td></td><td>-1</td></tr> </table>	x	-1	x	-1	x	-1		-1	$3x - 4$				
x	-1														
x	-1														
x	-1														
	-1														
f)	"The total of three times y. then plus negative four"	<table border="1"> <tr><td>y</td><td>-1</td></tr> <tr><td>y</td><td>-1</td></tr> <tr><td>y</td><td>-1</td></tr> <tr><td></td><td>-1</td></tr> </table>	y	-1	y	-1	y	-1		-1	$3y - 4$				
y	-1														
y	-1														
y	-1														
	-1														
g)	"Three lots of negative y. then plus negative four"	<table border="1"> <tr><td>-y</td><td>-1</td></tr> <tr><td>-y</td><td>-1</td></tr> <tr><td>-y</td><td>-1</td></tr> <tr><td></td><td>-1</td></tr> </table>	-y	-1	-y	-1	-y	-1		-1	$-3y - 4$				
-y	-1														
-y	-1														
-y	-1														
	-1														
h)	"Three lots of negative y. then subtract four"	<table border="1"> <tr><td>-y</td><td>-1</td></tr> <tr><td>-y</td><td>-1</td></tr> <tr><td>-y</td><td>-1</td></tr> <tr><td></td><td>-1</td></tr> </table>	-y	-1	-y	-1	-y	-1		-1	$-3y - 4$				
-y	-1														
-y	-1														
-y	-1														
	-1														
i)	"Three lots of all of x plus one"	<table border="1"> <tr><td>x</td><td>1</td></tr> <tr><td>x</td><td>1</td></tr> <tr><td>x</td><td>1</td></tr> </table>	x	1	x	1	x	1	$3(x + 1)$ OR $3x + 3$						
x	1														
x	1														
x	1														
j)	"Four lots of all of x plus one"	<table border="1"> <tr><td>x</td><td>1</td></tr> <tr><td>x</td><td>1</td></tr> <tr><td>x</td><td>1</td></tr> <tr><td>x</td><td>1</td></tr> </table>	x	1	x	1	x	1	x	1	$4(x + 1)$ OR $4x + 4$				
x	1														
x	1														
x	1														
x	1														
k)	"Four lots of all of y plus one"	<table border="1"> <tr><td>y</td><td>1</td></tr> <tr><td>y</td><td>1</td></tr> <tr><td>y</td><td>1</td></tr> <tr><td>y</td><td>1</td></tr> </table>	y	1	y	1	y	1	y	1	$4(y + 1)$ OR $4y + 4$				
y	1														
y	1														
y	1														
y	1														
l)	"Four lots of all of y subtract one"	<table border="1"> <tr><td>y</td><td>-1</td></tr> <tr><td>y</td><td>-1</td></tr> <tr><td>y</td><td>-1</td></tr> <tr><td>y</td><td>-1</td></tr> </table>	y	-1	y	-1	y	-1	y	-1	$4(y - 1)$ OR $4y - 4$				
y	-1														
y	-1														
y	-1														
y	-1														
m)	"Four lots of all of double y subtract one"	<table border="1"> <tr><td>y</td><td>y</td><td>-1</td></tr> <tr><td>y</td><td>y</td><td>-1</td></tr> <tr><td>y</td><td>y</td><td>-1</td></tr> <tr><td>y</td><td>y</td><td>-1</td></tr> </table>	y	y	-1	y	y	-1	y	y	-1	y	y	-1	$4(2y - 1)$ OR $8y - 4$
y	y	-1													
y	y	-1													
y	y	-1													
y	y	-1													

4 The table below shows an algebraic expression either given in words, using a diagram or as an expression. Complete the table.

	Written Meaning	Pictorial Representation	Algebraic Expression												
a)	"The total of x and y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td><td style="text-align: center;">y</td></tr></table>	x	y	$x + y$										
x	y														
b)	"The total of y and x"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td><td style="text-align: center;">y</td></tr></table>	x	y	$x + y$										
x	y														
c)	"x subtract y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td><td style="text-align: center;">-y</td></tr></table>	x	-y	$x - y$										
x	-y														
d)	"y subtract x"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">y</td><td style="text-align: center;">-x</td></tr></table>	y	-x	$y - x$										
y	-x														
e)	"x subtract two lots of y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td><td style="text-align: center;">-y</td></tr><tr><td></td><td style="text-align: center;">-y</td></tr></table>	x	-y		-y	$x - 2y$								
x	-y														
	-y														
f)	"x subtract three lots of y"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td><td style="text-align: center;">-y</td></tr><tr><td></td><td style="text-align: center;">-y</td></tr><tr><td></td><td style="text-align: center;">-y</td></tr></table>	x	-y		-y		-y	$x - 3y$						
x	-y														
	-y														
	-y														
g)	"x subtract three lots of y, then plus four"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td><td style="text-align: center;">-y</td><td style="text-align: center;">1</td></tr><tr><td></td><td style="text-align: center;">-y</td><td style="text-align: center;">1</td></tr><tr><td></td><td style="text-align: center;">-y</td><td style="text-align: center;">1</td></tr><tr><td></td><td></td><td style="text-align: center;">1</td></tr></table>	x	-y	1		-y	1		-y	1			1	$x - 3y + 4$
x	-y	1													
	-y	1													
	-y	1													
		1													
h)	"x subtract two lots of y, then plus four"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td><td style="text-align: center;">-y</td><td style="text-align: center;">1</td></tr><tr><td></td><td style="text-align: center;">-y</td><td style="text-align: center;">1</td></tr><tr><td></td><td></td><td style="text-align: center;">1</td></tr><tr><td></td><td></td><td style="text-align: center;">1</td></tr></table>	x	-y	1		-y	1			1			1	$x - 2y + 4$
x	-y	1													
	-y	1													
		1													
		1													
i)	"x subtract two lots of y, plus two"	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">x</td><td style="text-align: center;">-y</td><td style="text-align: center;">-1</td><td style="text-align: center;">-1</td></tr><tr><td></td><td style="text-align: center;">-y</td><td style="text-align: center;">-1</td><td style="text-align: center;">-1</td></tr></table>	x	-y	-1	-1		-y	-1	-1	$x - 2(x + 2)$ OR $x - 2x - 4$				
x	-y	-1	-1												
	-y	-1	-1												
j)	Explain why the x term and the numerical term are either positive or negative in part i)														