

HOME LEARNING

Year 10 Home Learning Pack 5

Focus for this week: Entry Level: Finding the length of time GCSE: Expanding brackets

Essential learning:	<ul style="list-style-type: none">Find the difference between two times (hours, half hours and quarter hours)
Practising:	<ul style="list-style-type: none">Find the difference between two times (hours and minutes)Convert between hours, minutes and secondsAdding, Subtracting, Multiplying and dividing negative numbers
Learning about:	<ul style="list-style-type: none">Simplify algebraic expressions by multiplying a single term over a bracket.Simplify extended expressions by multiplying a single term over a bracket
Extension:	<ul style="list-style-type: none">Expand more than one brackets and then simplify the answer

Contents:

Worksheet 1: Difference between two times

Worksheet 2: Convert between hours, minutes and seconds.

Worksheet 3: Calculating with negative numbers & Simplifying algebraic expressions

Worksheet 4: Expanding single bracket

Worksheet 5: Expanding single bracket & expanding double brackets

Tasks:

- Look at the learning objectives, reflect on what you are already confident with, what you would like to practise and what you would like to learn this week
- Choose 2-3 worksheets to complete this week and email them to Mr. Croft
- Login to MyMaths and complete MyMaths tasks
- Spend 10 minutes a day on Times Table Rock Stars; Numbots OR Sumdog
- Practise reading and saying the time (to someone else) throughout the day. Say it in different ways (e.g. 25 past 4 in the afternoon; 4:25 pm; 16:25)
- Please email a photo of any worksheets or poster you complete to the email address below.
This will earn you a golden token.

Additional activities:

- Given a start and finish time for a film. Work out its length
- Given a length and a start time for a film (or a repeat of a football match), work out the finish time
- Do Diagnostic questions or Mangahigh tasks for more challenge (*email Mr.Croft for more info*)
- More practise/help with expanding and simplifying single brackets:** Go to
<https://www.thenational.academy/year-8/mathematics/expanding-and-simplifying-with-single-brackets-year-8-wk1-3>
- More challenge (expanding double brackets):** Have a look at this lesson:
<https://www.thenational.academy/year-10/mathematics/expanding-double-brackets-1-year-10-wk1-4>

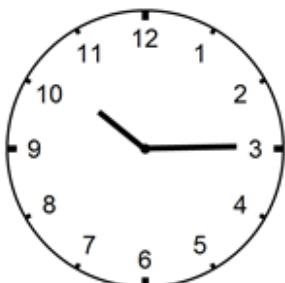
If you have queries about this work, please contact me at acroft@bower-grove.kent.sch.uk

Worksheet 1: Difference between two times

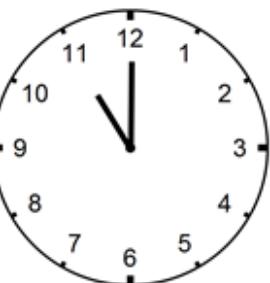
Name

1 Calculate the difference in time between the two times shown.

a)

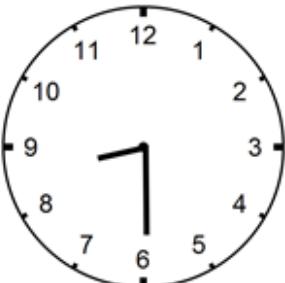


to

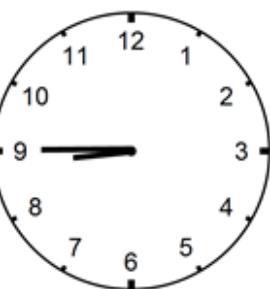


..... minutes

b)



to



..... minutes

2 Calculate the difference in time between the 2 times shown.

a) 1:30 to 2:15 minutes

b) 11:45 to 12:30 minutes

c) 2:15 to 3:15 minutes

d) 3:00 to 4:30 hour minutes

e) 5:30 to 6:45 hour minutes

f) 12:15 to 1:45 hour minutes

Email completed worksheets to me at acroft@bower-grove.kent.sch.uk . Each good attempt earns a golden token.

Worksheet 2: Convert between hours, minutes and seconds.

Task 1: Complete the following.

- a) 1 hour = minutes b) 3 hours = minutes
- c) 120 seconds = minutes d) 4 minutes = seconds
- e) 180 minutes = hours f) 600 minutes = hours

Task 2: Complete the following.

- a) 150 seconds = minutes seconds
- b) 220 seconds = minutes seconds
- c) 310 minutes = hours minutes

Task 3: Complete the following.

- a) 1 hour 45 minutes = minutes
- b) 3 hour 20 minutes = minutes
- c) 2 minutes 50 seconds = seconds

Task 4:

It takes Archie 3 minutes 15 seconds to complete a puzzle.

It takes Isi 205 seconds to complete a puzzle.

Who has taken the longest time?

Show how you decide.

.....
.....
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Worksheet 3: Calculating with negative numbers & Simplifying algebraic expressions

These websites show some advice on how to add, subtract, multiply and divide with negative numbers:

Adding and Subtracting negative numbers: <https://www.mathsisfun.com/positive-negative-integers.html>

Multiplying and dividing negative numbers: <https://www.mathsisfun.com/multiplying-negatives.html>

Task 1: Adding and subtracting negative numbers

a) $-4 + -3 = \underline{\hspace{2cm}}$

$+$ $+$ $\Rightarrow +$ a friend of a friend is my friend

b) $5 - -4 = \underline{\hspace{2cm}}$

$+$ $-$ $\Rightarrow -$ a friend of an enemy is my enemy

c) $4 + -3 - -2 = \underline{\hspace{2cm}}$

$-$ $+$ $\Rightarrow -$ an enemy of a friend is my enemy

d) $-6 + -5 - -4 + -3 - -2 + -1 = \underline{\hspace{2cm}}$

$-$ $-$ $\Rightarrow +$ an enemy of an enemy is my friend

e) $42 + -30 - -21 = \underline{\hspace{2cm}}$

Task 2: Multiplying and dividing negative numbers

a) $-4 \times -3 = \underline{\hspace{2cm}}$

 Example $3 \times 2 = 6$

b) $5 \times -4 = \underline{\hspace{2cm}}$

 two negatives make a positive: $(-3) \times (-2) = 6$

c) $4 \times -3 = \underline{\hspace{2cm}}$

 a negative and a positive make a negative: $(-3) \times 2 = -6$

d) $-30 \div 5 = \underline{\hspace{2cm}}$

 a positive and a negative make a negative: $3 \times (-2) = -6$

e) $-42 \div -6 = \underline{\hspace{2cm}}$

f) $-4 \times -3 \times 2 = \underline{\hspace{2cm}}$

g) $35 \div -4 = \underline{\hspace{2cm}}$

h) $4 \times -3 \times -2 \times -1 = \underline{\hspace{2cm}}$

Task 3: Simplifying algebraic expressions

Hint: $3 \times 2b = 6b$ $3b \times 2b = 6b^2$

a) $b + b + b - 7b = \underline{\hspace{2cm}}$

b) $-5b - -b + -7b = \underline{\hspace{2cm}}$

c) $4 \times -7b = \underline{\hspace{2cm}}$

d) $42b \div -7 = \underline{\hspace{2cm}}$

e) $-3b \times -7b = \underline{\hspace{2cm}}$

f) $-18b \div -3b = \underline{\hspace{2cm}}$

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Worksheet 4: Expanding single bracket

We are used to seeing algebraic expressions written like this: $10x + 5$ or like this: $18x - 12$

Equivalent expressions can also be written using brackets. For example:

$$10x + 5 \equiv 5(x + 1) \quad \text{and} \quad 18x - 12 \equiv 6(3x - 2)$$

It is useful to be able to work with algebraic brackets because it helps build our ‘Maths muscles’. These help us solve more complex problems and develop our thinking skills. We will be learning to expand brackets this week.

Task 1: Check we are confident at multiplying algebraic terms (i.e. numbers and letters)

Four of these number sentences are true and three are false. Circle the number sentences that are true.

$$3 \times 4x = 7x \quad 5a \times 3 = 15a \quad 6a \times 2b = 62ab \quad 6a \times 2b = 12ab$$

$$4 \times 2b = 8b \quad 4 \times 2b = 8^2 \quad y \times 2y = 2y^2$$

Task 2: We can use the box method to help us multiply out (or expand) a bracket.

Example: Multiply out $3(x + 2)$

Step 1: Draw a box as shown and put the numbers in as shown:

	x	$+2$
3		

Step 2: Multiply as shown and find the answers:

	x	$+2$
3	$3 \times x$ $= 3x$	$3 \times +2$ $= +6$

Step 3: Combine the answers together: $3x + 6$

Now have a go at using the boxes to expand the brackets:

a) $4(b + 3) \equiv$ _____

	b	$+3$
4		

b) $4(b + 2) \equiv$ _____

—	b	$+3$
—		

c) $5(x + 6) \equiv$ _____

—	x	$+$ —
—		

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Worksheet 5: Expanding single bracket & expanding double brackets

Task 1: Use the box method shown in worksheet 4 to expand the following brackets:

a) $5(x + 4) \equiv$

b) $6(x + 4) \equiv$

c) $3(x + 7) \equiv$

d) $9(x + 2) \equiv$

Task 2: Explain how we know that $6(x - 3) \equiv 6x - 18$

Task 3: Explain how we know that $6(2x - 3) \equiv 12x - 18$

Task 4: Expand these brackets:

a) $5(3x - 4) \equiv$

b) $6(2x - 4) \equiv$

c) $3(5x - 7) \equiv$

d) $9(3x - 2) \equiv$

Extension: Double brackets can be multiplied out.

Example: $(x + 3)(x + 2)$

Therefore $(x + 3)(x + 2) \equiv x^2 + 2x + 3x + 6$

You may notice that $2x + 3x$ can be simplified as $5x$

Our final answer is $(x + 3)(x + 2) \equiv x^2 + 5x + 6$

Task 5: Expand these brackets:

a) $(x + 5)(x + 4) \equiv$

b) $(x + 6)(x + 4) \equiv$

c) $(x + 4)(x - 7) \equiv$

d) $(x + 9)(3x + 2) \equiv$

x	x	$+2$
x	$x \times x = x^2$	$x \times +2 = +2x$
$+3$	$x \times +2 = +3x$	$+3 \times +2 = +6$

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