

HOME LEARNING

Year 10 – Home Learning 6 - Maths

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

Essential learning:	<ul style="list-style-type: none">• Know that: 1 week is 7 days; 24 hours in a day; 1 hour is 60 minutes; 1 minute is 60 seconds
Practising:	<ul style="list-style-type: none">• Add up to three lengths of time given in minutes and hours• Adding, Subtracting, Multiplying and dividing negative numbers
Learning about:	<ul style="list-style-type: none">• Revise expanding brackets• Factorise an algebraic expression.
Extension:	<ul style="list-style-type: none">• Factorise an algebraic expression involving squared algebraic terms.

Contents:

Worksheet 1: Know that: 1 week is 7 days; 24 hours in a day; 1 hour is 60 minutes; 1 minute is 60 seconds

Worksheet 2: Add up to three lengths of time given in minutes and hours

Worksheet 3: Calculating with negative numbers & expanding brackets

Worksheet 4: Expanding single bracket

Worksheet 5: Factorise an algebraic expression

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
- Play Maths games on MangaHigh (Maths games website) with this link: <https://app.mangahigh.com/register-student/41790?p=946671>
- **More practise (expanding and simplifying brackets):** Go to <https://www.thenational.academy/year-10/maths/expanding-and-simplifying-with-single-brackets-year-10-wk1-2>
- **More challenge (factorisation):** Have a look at this lesson: <https://www.thenational.academy/year-10/maths/factorisation-year-10-wk1-3>

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

Worksheet 1: Know that: 1 week is 7 days; 24 hours in a day; 1 hour is 60 minutes; 1 minute is 60 seconds

1 Complete the following.

a) 1 week = days

b) 2 weeks = days

c) 5 weeks = days

d) 10 weeks = days

e) 21 days = weeks

f) 28 days = weeks

2 Complete the following.

a) 1 hour = minutes

b) 3 hours = minutes

c) 120 minutes = hours

d) 240 minutes = hours

3 Complete the following.

a) 60 seconds = minute
minutes

b) 180 seconds =

c) 2 minutes = seconds

d) 5 minutes = seconds

4 Complete the following.

a) 1 day = hours

b) 3 days = hours

c) 48 hours = days

d) 480 hours = days

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

Worksheet 2: Add up to three lengths of time given in minutes and hours

1 The table below shows the times spent on different activities during a training session by a group of students. Complete the table to show the total time for each student.

	Warm up	Running	Total time
Alex	10 minutes	45 minutes	
Bob	15 minutes	1 hour 10 minutes	
Carly	10 minutes	1 hour 40 minutes	
Deven	25 minutes	1 hour 40 minutes	
Eric	20 minutes	1 hour 55 minutes	

2 Rob works at a garage.

One day he spends 2 hour 15 minutes cleaning cars
 1 hour 45 minutes phoning customers
 2 hours 25 minutes processing orders.

How much time has he spent working altogether?

.....
.....

3 Brin decides to watch all 3 films in one go. The playing time of each film is

Film 1 : 1 hour 40 minutes **Film 2** : 2 hours 5 minutes **Film 3** : 1 hour 55 minutes.

How much time will he need to watch all 3 films?

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Worksheet 3: Calculating with negative numbers & Expanding brackets (practise from last week)

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) $9 + -5 =$ _____
- b) $-6 - -4 =$ _____
- c) $-15 - +4 - -9 =$ _____
- d) $-16 + -15 - -14 =$ _____
- e) $39 - -34 + -13 =$ _____
- $+$ $+$ \Rightarrow $+$ a friend of a friend is my friend
- $+$ $-$ \Rightarrow $-$ a friend of an enemy is my enemy
- $-$ $+$ \Rightarrow $-$ an enemy of a friend is my enemy
- $-$ $-$ \Rightarrow $+$ an enemy of an enemy is my friend

Task 2: Multiplying and dividing negative numbers

- a) $-4 \times -9 =$ _____
- b) $5 \times -7 =$ _____
- c) $6 \times -3 =$ _____
- d) $-55 \div 5 =$ _____
- e) $-72 \div -6 =$ _____
- g) $56 \div -7 =$ _____
- f) $-5 \times -4 \times 3 =$ _____
- h) $10 \times 4 \times 2 \times -1 =$ _____
- Example**
-  \times  two positives make a positive:  $3 \times 2 = 6$
-  \times  two negatives make a positive:  $(-3) \times (-2) = 6$
-  \times  a negative and a positive make a negative:  $(-3) \times 2 = -6$
-  \times  a positive and a negative make a negative:  $3 \times (-2) = -6$

Task 3: Expand the following brackets.

Reminder: $10x + 5 \equiv 5(x + 1)$ and $18x - 12 \equiv 6(3x - 2)$

- a) $6(x + 3) \equiv$ _____
- b) $6(x - 4) \equiv$ _____
- c) $7(x + 4) \equiv$ _____
- d) $7(x - 4) \equiv$ _____
- e) $9(x + 4) \equiv$ _____
- f) $9(x - 4) \equiv$ _____

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Worksheet 4: Expanding single brackets

Revision from last week: We can use the box method to help us multiply out (or expand) a bracket.

Example: Multiply out $-5(2x + 6)$

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

	$2x$	$+6$
-5		

Step 2: Multiply as shown and find the answers:

	$2x$	$+6$
-5	$-5 \times 2 \times x$	$-5 \times +6$

Step 3: Combine the answers together:

$-10x - 30$

	$2x$	$+6$
-5	$-10x$	-30

Task 1: Now have a go at using the boxes to expand the brackets:

- a) $-6(x + 4) \equiv$ _____
- b) $-6(2x + 4) \equiv$ _____
- c) $-3(x + 7) \equiv$ _____
- d) $-3(4x + 7) \equiv$ _____
- e) $-9(2x + 4) \equiv$ _____
- f) $-9(5x + 4) \equiv$ _____

Task 2: Alice and Bob are trying to expand this bracket: $-6(2x - 4)$

Alice thinks the answer is $-12x + 24$

Bob thinks the answer is $-12x - 24$

Explain why Alice is correct.....

Task 3: Now have a go at using the boxes to expand the brackets:

- a) $-5(3x + 2) \equiv$ _____
- b) $-5(3x - 2) \equiv$ _____
- c) $-11(6x + 7) \equiv$ _____
- d) $-11(4x - 7) \equiv$ _____
- e) $-9(4x + 4) \equiv$ _____
- f) $-9(5x + 12) \equiv$ _____
- g) $-5(4 - 3x) \equiv$ _____
- h) $-5(3 - 2x) \equiv$ _____

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Worksheet 5: Factorising expressions into brackets

We can use the box method to help us factorise expressions into brackets. This means put an expression into brackets. For example $6x + 12$ into brackets is $3(2x + 4)$. We call it 'factorising' because we are looking for a common factor. In the example, 6 and 12 are both in the three times table. Three is a *common factor* of 6 and 12.

Example: Factorise the expression $15x + 20$

Step 1: Write the expression on the *inside* of the box we used to expand brackets

	$15x$	$+20$

Step 2: Find a common factor and write it on the left hand side. This is the number we will use on the outside of the bracket.

5	$15x$	$+20$

Step 3: Now divide each term by the factor to find the remaining terms inside the bracket.

	$3x$	$+4$
5	$15x$	$+20$

Step 4: Write out your answer:

$$(3x + 4) \equiv 15x + 20$$

Task 1: Factorise the following expressions. Write your box method/workings out on a separate piece of paper.

a) $15x + 25 \equiv$ _____

b) $15x + 40 \equiv$ _____

c) $4x + 10 \equiv$ _____

d) $6x + 10 \equiv$ _____

e) $12x + 16 \equiv$ _____

f) $12x + 20 \equiv$ _____

g) $9x + 6 \equiv$ _____

h) $15x + 6 \equiv$ _____

i) $12x + 6 \equiv$ _____

j) $12x - 6 \equiv$ _____

k) $18x + 24 \equiv$ _____

l) $18x - 36 \equiv$ _____

m) $9x + 72 \equiv$ _____

n) $9x - 54 \equiv$ _____

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