Mathematics Non-Negotiables

Year 5

Non-negotiables are the minimum expectations that all pupils must attain by the end of year.

These prompt sheets have been designed to assist teachers with planning/assessment and as an ideal support tool for parent's evenings/progress meetings etc.

The content identifies basics to ensure children make rapid progress and access learning in other areas, as well as securing success in terms of preparing children for the next stages in their learning.

Written with age appropriate expectations in mind, they:

- focus on the basics; making a difference to progress for all children
- support teachers in recognising key areas to promote progress
- are based on the average pupil in the cohort, supporting the need for differentiation.

Non-negotiables are in no way intended to cover the entirety of the curriculum – they are an on-going reminder of key objectives for the year group. They are the basics in order to embed and support meaningful learning.

Content:
Mathematics Non-negotiables End of Year Expectations for Year 5 followed by an activity booklet containing example questions.

Mathematics Non-Negotiables

End of Year Expectations for Year 5

- Count forwards and backward with positive and negative numbers through zero
- Count forwards/backwards in steps of powers of 10 for any given number up to 1,000,000
- Compare and order numbers up to 1,000,000
- Compare and order numbers with 3 decimal places
- Read Roman numerals to 1,000
- Identify all multiples and factors, including finding all factor pairs of two numbers
- Use known tables to derive other number facts
- Recall prime numbers up to 19
- Recognise and use square numbers and cube numbers
- Recognise place value of any number up to 1,000,000
- Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 or 100,000
- Round decimals with 2 decimal places to nearest whole number and 1 decimal place
- Add and subtract: Numbers with more than 4-digits using formal written method
- Use rounding to check answers
- Multiply: 4-digits by 1-digit/ 2-digit
- Divide: Up to 4-digits by 1-digit
- Multiply & divide: Whole numbers & decimals by 10, 100 and 1,000
- Recognise and use thousandths
- Recognise mixed numbers and improper fractions and convert from one to another
- Multiply proper fractions and mixed numbers by whole numbers
- Identify and write equivalent fractions
- Solve time problems using timetables and converting between different units of time

- Count forwards and backward with positive and negative numbers through zero

Start at eleven and count backwards to minus ten	Start at minus twenty and count forwards to six	Start at five and count backwards to minus twelve	Start at minus eight and count forwards to two

Start at minus eleven and count forwards to ten	Start at two and count backwards to minus thirteen	Start at minus four and count forwards to twelve	Start at ten and count backwards to minus nineteen

- Count forwards/backwards in steps of powers of 10 for any given number up to 1,000,000

Write the next four numbers in the sequence according to the given rule					
+ 10	4,631				
– 10	4,631				
+ 100	325,974				
– 100	325,974				
+ 1,000	82,203				
– 1,000	82,203				
+ 10,000	981,310				
– 10,000	987,310				
+ 100,000	607,704				
– 100,000	607,704				

- Compare and order numbers up to 1,000,000

Order the numbers from smallest to largest.

328,735	101,008	63,774	990,566	405,198	405,658

- Compare and order numbers with 3 decimal places

Order the numbers from smallest to largest

1.214	0.999	0.031	1.204	0.829	0.854

- Read Roman numerals to 1,000

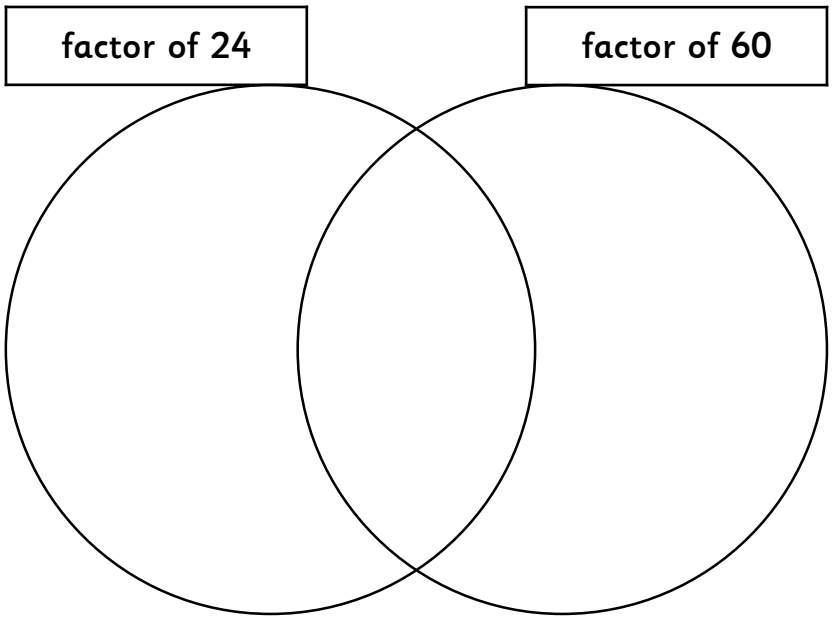
Write in digits the Roman numeral shown

XXXVII	LX	M	C	LXXX	D

XCIX	DCCC	CMXCI	CM	CCIX	DCCXC

- Identify all multiples and factors, including finding all factor pairs of two numbers

Complete the Venn Diagram with factors



Write the factor pairs for the following numbers:

factor pairs of 40

factor pairs of 50

List the multiples of 6	List the multiples of 8	What are the common multiples?

- Use known tables to derive other number facts

5 x 8 = ☐	5 x 80 = ☐	500 x 8 = ☐
5 x 0.8 = ☐	50 x 0.8 = ☐	500 x 0.8 = ☐
0.5 x 0.8 = ☐	0.5 x 0.08 = ☐	0.05 x 0.08 = ☐

- Recall prime numbers up to 19

List the prime numbers up to 19:

- Recognise and use square numbers and cube numbers

Tick the square numbers:

49	1	12	100	50	9	121	16
☐	☐	☐	☐	☐	☐	☐	☐
120	**4**	**81**	**25**	**85**	**64**	**36**	**29**
☐	☐	☐	☐	☐	☐	☐	☐

Tick the cube numbers:

333	64	343	20	1	150	729	30
☐	☐	☐	☐	☐	☐	☐	☐
8	**1000**	**1200**	**125**	**216**	**100**	**27**	**512**
☐	☐	☐	☐	☐	☐	☐	☐

Year 5

- Recognise place value of any number up to 1,000,000

Write the digits to form the number

words	digits
three hundred-thousands, seven ten-thousands, two thousands, four hundreds, eight tens and three ones	
nine hundred-thousands, no ten-thousands, seven thousands, two hundreds, one ten and nine ones	
one hundred-thousand, five ten-thousands, eight thousands, four hundreds, no tens and eight ones	
seven hundred-thousands, four ten-thousands, five thousands, no hundreds, six tens and one ones	
one million, no hundred-thousands, no ten-thousands, no thousands, no hundreds, no tens and no ones	

Write the place value words that form the given number

Words	digits
	677,521
	985,624
	304,611
	594,300
	700,007

- Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 or 100,000

Complete the table:

	nearest 10	nearest 100	nearest 1,000	nearest 10,000	nearest 100,000
841,204					
366,512					
997,986					
104,755					

- Round decimals with 2 decimal places to nearest whole number and 1 decimal place

Complete the tables:

	nearest whole number	nearest 1 decimal place
3.26		
6.09		
74.98		
13.56		

	nearest whole number	nearest 1 decimal place
0.69		
1.21		
45.45		
15.01		

- Add and subtract: Numbers with more than 4-digits using formal written method

Complete the column method addition questions

	8	4	2	3	7	5
+		6	4	8	7	1

	1	5	5	7	8	7
+	5	5	5	0	0	3

	5	9	9	0	0	1
+	1	2	6	7	9	9

Complete the column method subtraction questions

	9	0	1	3	2	8
–	2	7	6	2	1	6

	5	8	8	0	1	4
–	1	0	0	7	4	6

	7	3	0	2	1	3
–	6	2	8	9	9	9

- Use rounding to check answers

Complete the table:

	Rounded Answer	Actual Answer
746 + 897 =	700 + 900 =	746 + 897 =
5,874.1 + 307.9 =		
10,001.9 – 7,985.4 =		
968,745.4 – 609,711.9 =		

- Multiply: 4-digits by 1-digit/ 2-digit

Complete the column method multiplication questions

4,364 x 8 =

6,877 x 4 =

3,745 x 6 =

9,911 x 7 =

Complete the column method multiplication questions

2,345 x 32 =

4,881 x 51 =

7,466 x 97 =

6,752 x 68 =

- Divide: Up to 4-digits by 1-digit

Complete the questions

2,928 ÷ 3 =

5,887 ÷ 7 =

3,465 ÷ 9 =

6,730 ÷ 5 =

- Multiply & divide: Whole numbers & decimals by 10, 100 and 1,000

Complete the table:

	x 10	x 100	x 1000
604			
13			
76			
9,800			
	÷ 10	÷ 100	÷ 1000
4,400			
6,754			
9,188			
3,010			

Complete the table:

	x 10	x 100	x 1000
4.2			
9.05			
78.7			
302.02			
	÷ 10	÷ 100	÷ 1000
6,054.20			
5,965.6			
2,121.12			
9,600.9			

- Recognise and use thousandths

Which digit is in the thousandths place?

89.6521	9871.325	6.0291	3.12

- Recognise mixed numbers and improper fractions and convert from one to another

Convert the improper fractions into mixed numbers:

$\frac{39}{4} =$ ___ $\quad \frac{16}{3} =$ ___ $\quad \frac{31}{7} =$ ___ $\quad \frac{27}{5} =$ ___

Convert the mixed numbers into improper fractions:

___ $= 5\ \frac{1}{3}$ $\quad$ ___ $= 5\ \frac{2}{5}$ $\quad$ ___ $= 8\ \frac{3}{4}$ $\quad$ ___ $= 4\ \frac{3}{7}$

- Multiply proper fractions and mixed numbers by whole numbers

Multiply the fractions. Simplify the fraction where possible.

$\frac{2}{3} \times 5 =$ ___

$\frac{2}{4} \times 9 =$ ___

$\frac{3}{5} \times 6 =$ ___

$3\ \frac{2}{6} \times 4 =$ ___ $\quad 7 \times 2\ \frac{9}{10} =$ ___

$5\ \frac{3}{4} \times 6 =$ ___ $\quad 4 \times 8\ \frac{3}{7} =$ ___

$2\ \frac{7}{10} \times 3 =$ ___ $\quad 3 \times 6\ \frac{4}{6} =$ ___

- Identify and write equivalent fractions

Write the equivalent fraction:

$\frac{4}{12} = \frac{\square}{6}$ $\frac{10}{12} = \frac{\square}{6}$ $\frac{3}{4} = \frac{\square}{12}$ $\frac{1}{7} = \frac{\square}{14}$ $\frac{3}{6} = \frac{\square}{4}$

- Solve time problems using timetables and converting between different units of time

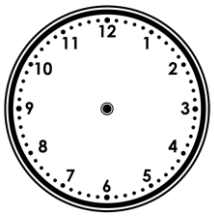
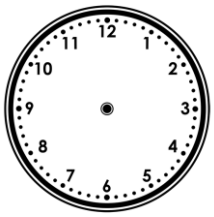
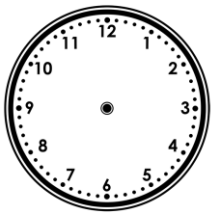
This is part of a train timetable

Snowacre	09.05	09.40	10.15	11.05
Faycrest	09.45	–	10.50	11.45
Strongburn	10.05	–	11.15	12.05
Woodcastle	10.45	10:30	11.55	12.45

How long does it take the first train to travel from Snowacre to Woodcastle?

I need to be in Woodcastle by 12 midday. What is the latest train I can catch from Strongburn?

How many trains pass through Strongburn between 10:00am and 12:00pm?

Analogue	Time in words	12 hour clock	24 hour clock
			22:21
	Twenty-three minutes to seven in the evening		
		6:51am	

- Count forwards and backward with positive and negative numbers through zero

Start at eleven and count backwards to minus ten	Start at minus twenty and count forwards to six	Start at five and count backwards to minus twelve	Start at minus eight and count forwards to two
Start at minus eleven and count forwards to ten	Start at two and count backwards to minus thirteen	Start at minus four and count forwards to twelve	Start at ten and count backwards to minus nineteen

- Count forwards/backwards in steps of powers of 10 for any given number up to 1,000,000

Write the next four numbers in the sequence according to the given rule					
+ 10	4,631	4641	4651	4661	4671
– 10	4,631	4621	4611	4601	4591
+ 100	325,974	326,074	326,174	326,274	326,374
– 100	325,974	325,874	325,774	325,674	325,574
+ 1,000	82,203	83,203	84,203	85,203	86,203
– 1,000	82,203	81,203	80,203	79,203	78,203
+ 10,000	981,310	991,310	1,001,310	1,011,310	1,021,310
– 10,000	987,310	977,310	967,310	957,310	947,310
+ 100,000	607,704	707,704	807,704	907,704	1,007,704
– 100,000	607,704	507,704	407,704	307,704	207,704

- Compare and order numbers up to 1,000,000

Order the numbers from smallest to largest.

328,735	101,008	63,774	990,566	405,198	405,658
63,774	101,008	328,735	405,198	405,658	990,566

- Compare and order numbers with 3 decimal places

Order the numbers from smallest to largest

1.214	0.999	0.031	1.204	0.829	0.854
0.031	0.829	0.854	0.999	1.204	1.214

- Read Roman numerals to 1,000

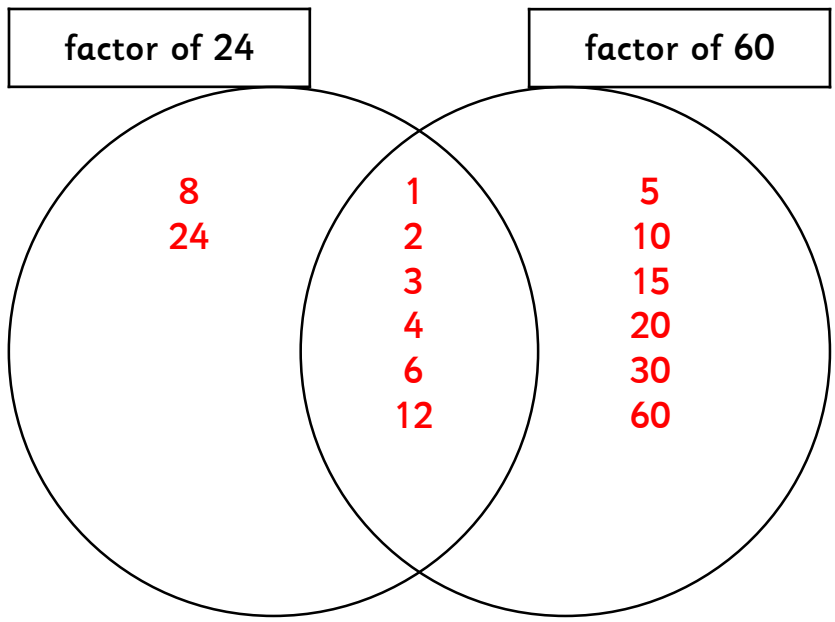
Write in digits the Roman numeral shown

XXXVII	LX	M	C	LXXX	D
37	60	1000	100	80	500

XCIX	DCCC	CMXCI	CM	CCIX	DCCXC
99	800	991	900	209	790

- Identify all multiples and factors, including finding all factor pairs of two numbers

Complete the Venn Diagram with factors



Write the factor pairs for the following numbers:

factor pairs of 40	factor pairs of 50
1 x 40, 2 x 20, 4 x 10, 5 x 8	1 x 50, 2 x 25, 5 x 10

List the multiples of 6	List the multiples of 8	What are the common multiples?
6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72	8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96	24, 48, 72

- Use known tables to derive other number facts

5 x 8 = 40	5 x 80 = 400	500 x 8 = 4000
5 x 0.8 = 4.0	50 x 0.8 = 40	500 x 0.8 = 400
0.5 x 0.8 = 0.4	0.5 x 0.08 = 0.04	0.05 x 0.08 = 0.004

- Recall prime numbers up to 19

List the prime numbers up to 19:

2, 3, 5, 7, 11, 13, 17, 19

- Recognise and use square numbers and cube numbers

Tick the square numbers:

49	1	12	100	50	9	121	16
✓	✓		✓		✓	✓	✓
120	**4**	**81**	**25**	**85**	**64**	**36**	**29**
	✓	✓	✓		✓	✓	

Tick the cube numbers:

333	64	343	20	1	150	729	30
	✓	✓		✓		✓	
8	**1000**	**1200**	**125**	**216**	**100**	**27**	**512**
✓	✓		✓	✓		✓	✓

- Recognise place value of any number up to 1,000,000

Write the digits to form the number

words	digits
three hundred-thousands, seven ten-thousands, two thousands, four hundreds, eight tens and three ones	372,483
nine hundred-thousands, no ten-thousands, seven thousands, two hundreds, one ten and nine ones	907,219
one hundred-thousand, five ten-thousands, eight thousands, four hundreds, no tens and eight ones	158,408
seven hundred-thousands, four ten-thousands, five thousands, no hundreds, six tens and one ones	745,061
one million, no hundred-thousands, no ten-thousands, no thousands, no hundreds, no tens and no ones	1,000,000

Write the place value words that form the given number

Words	digits
six hundred-thousands, seven ten-thousands, seven thousands, five hundreds, two tens and one ones	677,521
nine hundred-thousands, eight ten-thousands, five thousands six hundreds, two tens and four ones	985,624
three hundred-thousands, no ten-thousands, four thousands, six hundreds, one tens and one ones	304,611
five hundred-thousands, nine ten-thousands, four thousands, three hundreds, no tens and no ones	594,300
seven hundred-thousands, no ten-thousands, no thousands, no hundreds, no tens and seven ones	700,007

- Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 or 100,000

Complete the table:

	nearest 10	nearest 100	nearest 1,000	nearest 10,000	nearest 100,000
841,204	841,200	841,200	841,000	840,000	800,000
366,512	366,510	366,500	367,000	370,000	400,000
997,986	997,990	998,000	998,000	1,000,000	1,000,000
104,755	104,760	104,800	105,000	100,000	100,000

- Round decimals with 2 decimal places to nearest whole number and 1 decimal place

Complete the tables:

	nearest whole number	nearest 1 decimal place
3.26	3	3.6
6.09	6	6.1
74.98	75	75.0
13.56	14	13.6

	nearest whole number	nearest 1 decimal place
0.69	1	0.7
1.21	1	1.2
45.45	45	45.5
15.01	15	15.0

- Add and subtract: Numbers with more than 4-digits using formal written method

Complete the column method addition questions

	8	4	2	3	7	5
+	$_{1}$	6	4$_{1}$	8$_{1}$	7	1
	9	0	7	2	4	6

	1	5	5	7	8	7
+	5$_{1}$	5$_{1}$	5	0	0$_{1}$	3
	7	1	0	7	9	0

	5	9	9	0	0	1
+	1$_{1}$	2$_{1}$	6	7$_{1}$	9$_{1}$	9
	7	2	5	8	0	0

Complete the column method subtraction questions

	^{8}~~9~~	^{9}~~0~~	^{1}1	3	2	8
–	2	7	6	2	1	6
	6	2	5	1	1	2

	5	8	^{7}~~8~~	^{9}~~0~~^{1}	^{0}~~1~~	^{1}4
–	1	0	0	7	4	6
	4	8	7	2	6	8

	7	^{2}~~3~~	^{9}~~0~~^{1}	^{1}~~2~~^{1}	^{0}~~1~~	^{1}3
–	6	2	8	9	9	9
	1	0	1	2	1	4

- Use rounding to check answers

Complete the table:

	Rounded Answer		Actual Answer	
746 + 897 =	700 + 900 =	1,600	746 + 897 =	1,643
5,874.1 + 307.9 =	5900 + 300 = 6200		6,182	
10,001.9 – 7,985.4 =	10,000 + 8,000 =18,000		17,987.3	
968,745.4 – 609,711.9 =	970,000 – 610,000 = 380,000		359,033.5	

- Multiply: 4-digits by 1-digit/ 2-digit

Complete the column method multiplication questions

4,364 x 8 =				
	4	3	6	4
x	^{2}	^{5}	^{3}	8
3	4	9	1	2

6,877 x 4 =				
	6	8	7	7
x	^{3}	^{3}	^{2}	4
2	7	5	0	8

3,745 x 6 =				
	3	7	4	5
x	^{4}	^{2}	^{3}	6
2	2	4	7	0

9,911 x 7 =				
	9	9	1	1
x	^{6}			7
6	9	3	7	7

Complete the column method multiplication questions

2,345 x 32 =					
		2	3	4	5
	^{1}x	^{1}	^{1}	3^{1}	2
		4	6	9	0
	7	0^{1}	3^{1}	5	0
	7	5	0	4	0

4,881 x 51 =					
		4	8	8	1
	^{4}x	^{4}		5	1
		4	8	8	1
2	4	4	0^{1}	5	0
2	4	8	9	3	1

7,466 x 97 =					
		7	4	6	6
	^{4}x	$^{5\ 3}$	$^{5\ 4}$	9^{4}	7
	5	2	2	6	2
6^{1}	7	1^{1}	9^{1}	4	0
7	2	4	2	0	2

6,752 x 68 =					
		6	7	5	2
	^{4}x	$^{3\ 6}$	$^{1\ 4}$	6^{1}	8
	5	4	0	1	6
4	0	5	1	2	0
4	5	9	1	3	6

- Divide: Up to 4-digits by 1-digit

Complete the questions

2,928 ÷ 3 =				
	0	9	7	6
3	2	^{2}9	^{2}2	^{1}8

5,887 ÷ 7 =				
	0	8	4	1
7	5	^{5}8	^{2}8	7

3,465 ÷ 9 =				
	0	3	8	5
9	3	^{3}4	^{7}6	^{4}5

6,730 ÷ 5 =				
	1	3	4	6
5	6	^{1}7	^{2}3	^{3}0

- Multiply & divide: Whole numbers & decimals by 10, 100 and 1,000

Complete the table:

	x 10	x 100	x 1000
604	6,040	60,400	604,000
13	130	1,300	13,000
76	760	7,600	76,000
9,800	98,000	980,000	9,800,000
	÷ 10	÷ 100	÷ 1000
4,400	440	44	4.4
6,754	675.4	67.54	6.754
9,188	918.8	91.88	9.188
3,010	301	30.1	3.01

Complete the table:

	x 10	x 100	x 1000
4.2	42	420	4,200
9.05	90.5	905	9,050
78.7	787	7,870	78,700
302.02	3,020.2	30,202	302,020
	÷ 10	÷ 100	÷ 1000
6,054.20	605.42	60.542	6.0542
5,965.6	596.56	59.656	5.9656
2,121.12	212.112	21.2112	2.12112
9,600.9	960.09	96.009	9.6009

- Recognise and use thousandths

Which digit is in the thousandths place?

89.6521	9871.325	6.0291	3.12
2	5	9	0

- Recognise mixed numbers and improper fractions and convert from one to another

Convert the improper fractions into mixed numbers:

$\frac{39}{4} = 9\frac{3}{4}$ $\quad \frac{16}{3} = 5\frac{1}{3}$ $\quad \frac{31}{7} = 4\frac{3}{7}$ $\quad \frac{27}{5} = 5\frac{2}{5}$

Convert the mixed numbers into improper fractions:

$\frac{16}{3} = 5\frac{1}{3}$ $\quad \frac{27}{5} = 5\frac{2}{5}$ $\quad \frac{35}{4} = 8\frac{3}{4}$ $\quad \frac{31}{7} = 4\frac{3}{7}$

- Multiply proper fractions and mixed numbers by whole numbers

Multiply the fractions. Simplify the fraction where possible.

$\frac{2}{3} \times 5 = \frac{10}{3}$ $\quad = 3\frac{1}{3}$

$\frac{2}{4} \times 9 = \frac{18}{4}$ $\quad = 4\frac{1}{2}$

$\frac{3}{5} \times 6 = \frac{18}{5}$ $\quad = 3\frac{3}{5}$

$3\frac{2}{6} \times 4 = 13\frac{1}{3}$ $\qquad 7 \times 2\frac{9}{10} = 20\frac{3}{10}$

$5\frac{3}{4} \times 6 = 34\frac{1}{2}$ $\qquad 4 \times 8\frac{3}{7} = 33\frac{5}{7}$

$2\frac{7}{10} \times 3 = 8\frac{1}{10}$ $\qquad 3 \times 6\frac{4}{6} = 20\frac{\quad}{\quad}$

- Identify and write equivalent fractions

Write the equivalent fraction:

$\frac{4}{12} = \boxed{\frac{2}{6}}$ $\frac{10}{12} = \boxed{\frac{5}{6}}$ $\frac{3}{4} = \boxed{\frac{9}{12}}$ $\frac{1}{7} = \boxed{\frac{2}{14}}$ $\frac{3}{6} = \boxed{\frac{2}{4}}$

- Solve time problems using timetables and converting between different units of time

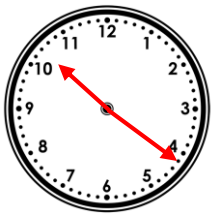
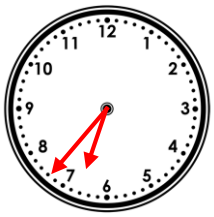
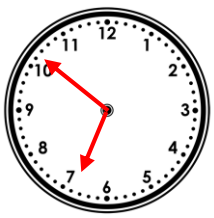
This is part of a train timetable

Snowacre	09.05	09.40	10.15	11.05
Faycrest	09.45	–	10.50	11.45
Strongburn	10.05	–	11.15	12.05
Woodcastle	10.45	10:30	11.55	12.45

How long does it take the first train to travel from Snowacre to Woodcastle? — 1 hour 40 minutes

I need to be in Woodcastle by 12 midday. What is the latest train I can catch from Strongburn? — 11.15

How many trains pass through Strongburn between 10:00am and 12:00pm? — 3 (2 stop, 1 does not stop)

Analogue	Time in words	12 hour clock	24 hour clock
	Twenty-one minutes past ten in the evening	10:21pm	22:21
	Twenty-three minutes to seven in the evening	6:37pm	18:37
	Nine minutes to seven in the morning	6:51am	06:51