

# Year 7 Maths

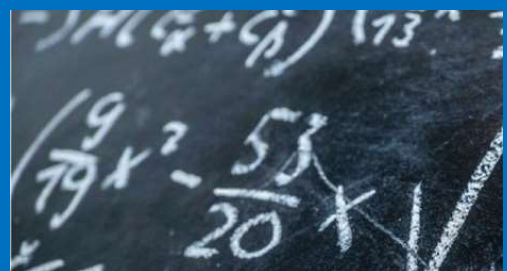
## Knowledge Organiser

### Term 4

<b>Name:</b>	<b>Class:</b>
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Keyword	Definition
Simplify	To make simpler or easier to understand by reducing the size of numbers or the number of terms.
Like terms	Terms which have the exact same letters in an expression.
Expression	One or more terms combined by addition or subtraction.
Function	A special relationship where each input has one output.
Substitute	Replace something in an expression with something else which is equal to it.
Polygon	A 2D shape with 3 or more straight connected edges.
Quadrilateral	A 4 sided polygon.
Sum	The result of an addition.
Interior Angle	An angle on the inside of a 2D shape.
Obtuse	An angle more than $90^\circ$ but less than $180^\circ$
Acute	An angle less than $90^\circ$
Reflex	An angle more than $180^\circ$ but less than $360^\circ$

<b>Homework 1 due:</b>	
<b>Homework 2 due:</b>	
<b>Homework 3 due:</b>	





## RESPECT

In Mathematics, a classroom environment should always be respectful. Students can show respect through:

- **Supporting each other with their learning.** Pupils should recognise that every individual has their own strengths and weaknesses and, as a class, we should 'up-lift' students.
- **Students should not be felt to be rushed by others in the classroom.** Respect that all students have different experiences and therefore will access the knowledge at different rates.
- **Being Polite.** As no different to the rest of school. Students should embrace diversity and treat all others with tolerance and decency.



## ASPIRATION

- **Building logical processes.** Understanding that learning mathematical concepts improves our logical reasoning which improves other aspects of our lives: language, culture, games etc. the essence of mathematics is in respect of ideas, structures and relationships by logical reasoning.
- **Every day needs.** Understanding that being numerate, along with literate, is a strong indicator of long-term success and students' ability to climb the tree of knowledge.



## RESILIENCE

- **I don't know it... yet.** Understanding that maths can be abstract and that, as with anything new, it will take time to learn. With time, you will succeed.
- **Mathematical concept won't always come easily.** Understanding that getting things wrong is a frustrating and not pleasant feeling but, to succeed, it is a passage we need to go through.
- **Practice makes permanent.** Mathematics is a logical subject such that, rehearsal and repetition of method is the key to being successful and committing the knowledge to long-term memory. This process takes time and will come with failures along the way which we must persevere through.

# Term 4 Overview

## Big Questions for the term

### Ratio and Proportion

- How do I write ratio?
- How is ratio linked to fractions and percentages?
- How can we model ratio questions?
- What is unitary ratio?
- Which is the best buy?
- How does proportion relate to recipes?
- How does speed relate to ratio and proportion?

### Simplifying and Substitution

- Why do we use algebra?
- How do we use algebra to write expressions?
- How can we simplify an expression?

## Knowledge Retrieval Questions – From Term 4

### Unit 5 – Ratio and Proportion

#	Question	Answer
1	How do you simplify a ratio?	Divide both numbers by a common factor.
2	How do you write a ratio into the form 1:n?	Divide both numbers in the ratio by the first number in the ratio.
3	What is the unitary method?	A method where the first step is making the ratio 1:n or n:1
4	How do you calculate best value?	Work out the cost of the same amount for each option and compare those.
5	How do you share an amount in a ratio?	Add the ratio numbers and divide by that to get the value of each part.

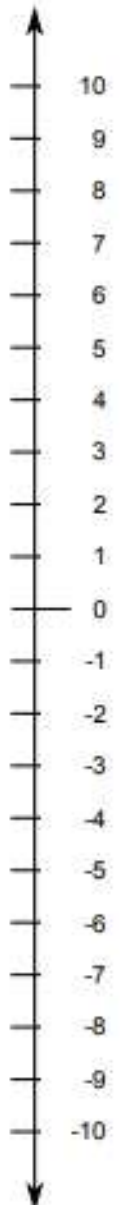
### Unit 6 – Simplifying and substitution

#	Question	Answer
1	In algebra, what does "collecting like terms" mean?	Adding or subtracting terms with the exact same letters
2	In algebra, what is substitution?	Replacing something in an expression with something else which is equal to it
3	The symbol for which operation is not written in algebra?	Multiplication
4	How is division represented algebraically?	As a fraction
5	How do you write expressions from sentences?	Replace unknown numbers with letters, everything else should be a number or an operation.

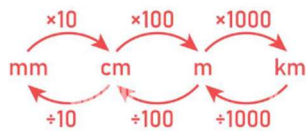
## Multiplication Chart

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

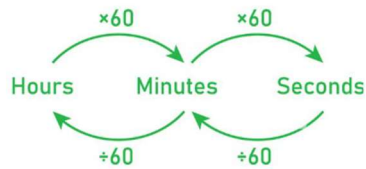
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	.	tenths	hundredths	thousandths	ten thousandths	hundred thousandths
HTH	TTh	Th	H	T	0	.	t	h	th	tth	hth
100,000	10,000	1,000	100	10	1	.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1,000}$	$\frac{1}{10,000}$	$\frac{1}{100,000}$
Whole Number Part						Decimal Point	Fractional Part				



### Length



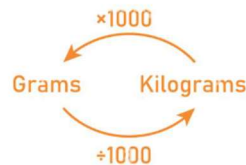
### Time



### Volume



### Mass



## Remote-Learning

If you are absent from school, lesson work can be found on your year group Teams channel: files -> class materials -> maths

This website is useful to students as it contains videos to support students understanding and also extra questions to extend and support students.

Please see your class teacher for any login issues

[vle.mathswatch.co.uk](http://vle.mathswatch.co.uk)

Username: firstnamesurname@dustonschool

Password: berrywood

### Term 4 - Homework 1

#	Type	Question	Answer
1	Knowledge	How do you find an equivalent fraction?	Multiply or divide the numerator and denominator by the same number.
	Application 1	State a fraction which is equivalent to $\frac{9}{72}$	
	Application 2	State a fraction which is equivalent to $\frac{15}{18}$	

2	Knowledge	How do you find a fraction of an amount?	Divide the amount by the denominator and multiply by the numerator.
	Application 1	Find $\frac{9}{11}$ of 66	
	Application 2	Find $\frac{20}{31}$ of 403	

3	Knowledge	How do you convert a decimal to a percentage?	Multiply by 100 (%)
	Application 1	Convert 0.67 into a percentage.	
	Application 2	Convert 0.173 into a percentage.	

4	Knowledge	How do you convert millimetres to metres?	Divide by 1000
	Application 1	Convert 200mm into m	
	Application 2	Convert 3000mm into m	

#	Type	Question	Answer
5	Knowledge	What does LCM stand for?	Lowest Common Multiple
	Application 1	What is the LCM for 4 and 12?	
	Application 2	What is the LCM for 6 and 26?	

6	Knowledge	What sign would the product of a positive and a negative number have?	Negative
	Application 1	What is the product of 12 and -6?	
	Application 2	What is the product of -9 and 11?	

7	Knowledge	What is a term-to-term rule?	A rule telling you how to get from one term to the next in a sequence
	Application 1	What is the term-to-term rule for the following sequence 9,10,11,12?	
	Application 2	What is the term-to-term rule for the following sequence 0.9,1,1.1,1.2?	

8	Knowledge	How do you find the difference between two numbers?	Subtract the smaller number from the larger one.
	Application 1	Find the difference between 122 and 22	
	Application 2	Find the difference between 122 and 16	

#	Type	Question	Answer
9	Knowledge	What should your answer be if the question tells you to evaluate?	A number
	Application 1	Evaluate $3+2\times 4$	
	Application 2	Evaluate $2+3\times 3$	

10	Knowledge	How do you convert kilograms into tonnes?	Divide by 1000
	Application 1	Convert 10,000kg into tonnes	
	Application 2	Convert 12,300kg into tonnes	

11	Knowledge	List the first 15 square numbers.	1,4,9,16,25,36,49,64,81,100,121,144,169,196,225
	Application 1	What is the 10 <sup>th</sup> square number?	
	Application 2	What is the 15 <sup>th</sup> square number?	

12	Knowledge	What is the definition of a factor?	A number which divides another number exactly.
	Application 1	List all the factors of 12	
	Application 2	List all the factors of 25	

## Term 4 - Homework 2

#	Type	Question	Answer
1	Knowledge	What is a denominator?	Bottom number in a fraction
	Application 1	What is the denominator in the fraction 4 tenths?	
	Application 2	What is the denominator in the fraction 19 sevenths?	

2	Knowledge	How do you convert a decimal to a fraction?	The numerator is the same digits without the decimal point, the denominator is the place value of the last digit.
	Application 1	Write 0.98 as a fraction.	
	Application 2	Write 0.110 as a fraction.	

3	Knowledge	How do you convert a fraction to a decimal if the denominator is a factor of 100?	Write the equivalent fraction with a denominator of 100 (then divide by 100)
	Application 1	What is $\frac{2}{20}$ as a decimal?	
	Application 2	What is $\frac{5}{500}$ as a decimal?	

4	Knowledge	How do you convert hours into minutes?	Multiply by 60
	Application 1	Convert 3 hours into minutes	
	Application 2	Convert 10 hours into minutes	

#	Type	Question	Answer
5	Knowledge	How do you convert metres to kilometres?	Divide by 1000
	Application 1	Convert 800m into km	
	Application 2	Convert 13000m into km	

6	Knowledge	What sign would the product of 2 negative numbers have?	Positive
	Application 1	What is the product of -4 and -4	
	Application 2	What is the product of -3 and -12	

7	Knowledge	What is the definition of a square number?	The product of a number and itself
	Application 1	Evaluate $4^2$	
	Application 2	Evaluate $10^2$	

8	Knowledge	What is a linear sequence?	A number pattern which increases or decreases by the same amount each time.
	Application 1	Is this sequence linear 2,3,5,7,9?	
	Application 2	Is this sequence linear 4,8,12,16?	

#	Type	Question	Answer
9	Knowledge	What does the word sum mean?	The result of addition.
	Application 1	Find the sum of 12 and 36	
	Application 2	Find the sum of 18 and 22	

10	Knowledge	How do you work out the value of a digit in a long number?	Ignore every other digit (make them zeroes)
	Application 1	What is the value of 3 in 230?	
	Application 2	What is the value of 3 in 2030	

11	Knowledge	How do you convert metres to centimetres?	Multiply by 100
	Application 1	Convert 5m into centimetres	
	Application 2	Convert 3.4m into centimetres	

12	Knowledge	How do you divide a number by 10?	Move all the digits 1 place to the right
	Application 1	Calculate $540 \div 10$	
	Application 2	Calculate $67 \div 10$	

### Term 4 - Homework 3

#	Type	Question	Answer
1	Knowledge	How do you multiply fractions?	Multiply the numerators and multiply the denominators.
	Application 1	Calculate $2/20 \times 1/10$	
	Application 2	Calculate $18/190 \times 13/90$	

2	Knowledge	How do you convert a mixed number to an improper fraction?	Multiply the whole number by the denominator and add it to the numerator
	Application 1	Convert 9 and $9/10$ into an improper fraction.	
	Application 2	Convert 13 and $15/16$ into an improper fraction.	

3	Knowledge	What is a denominator?	Bottom number in a fraction
	Application 1	What is the denominator in the fraction 7 tenths?	
	Application 2	What is the denominator in the fraction 11 sevenths?	

4	Knowledge	What's the first step when adding or subtracting fractions?	Write the fractions with a common denominator
	Application 1	Complete the first step of the calculation $8/16 + 5/8$	
	Application 2	Complete the first step of the calculation $12/9 + 15/18$	

#	Type	Question	Answer
5	Knowledge	What is a numerator?	Top number in a fraction
	Application 1	What is the numerator in the fraction 8 tenths?	
	Application 2	What is the numerator in the fraction 14 sixths?	

6	Knowledge	What sign would the answer to a negative number divided by a positive number have?	Negative
	Application 1	Evaluate $-12 \div 4$	
	Application 2	Evaluate $15 \div -3$	

7	Knowledge	What is a cube number?	The product of 3 equal numbers.
	Application 1	Evaluate $1^3$	
	Application 2	Evaluate $3^3$	

8	Knowledge	How do you add decimals?	Same method as usual, lining up the decimal points
	Application 1	Evaluate $3.2 + 4.2$	
	Application 2	Evaluate $12.6 + 0.3$	

#	Type	Question	Answer
9	Knowledge	How do you multiply a number by 10?	Move all the digits 1 place to the left
	Application 1	Evaluate $19.6 \times 10$	
	Application 2	Evaluate 10.03	

10	Knowledge	What does consecutive mean?	Following each other continuously.
	Application 1	List 3 numbers which are consecutive	
	Application 2	Which of these numbers are consecutive 10,11,4,6,9?	

11	Knowledge	What should your answer be if the question tells you to calculate?	A number
	Application 1	Calculate $3 - 2 \times 4$	
	Application 2	Calculate $9 \times 3 + 2$	

12	Knowledge	What is subtracting a negative number equivalent to?	Adding a positive number
	Application 1	Evaluate $(-3) - (-4)$	
	Application 2	Evaluate $9 - (-4)$	



# Cyber Security Analyst

*Cyber security analysts protect a company's network and systems from cyber attacks.*

Your day-to-day duties will include:

- installing, managing, and updating software on all the systems in an organisation
- monitoring networks
- looking for any unusual, unauthorised, or illegal activity
- designing and updating security systems
- developing security plans
- writing safety reports, and documenting security issues
- engaging in 'ethical hacking', for example by creating a fake security breach
- staying up-to-date with the latest potential threats and attacks
- researching trends and developments in information technology and security

## Working Hours and Environment

For this role, working hours are typically 35-40 a week. You may need to work flexibly depending on projects and the specific nature of the work.

Some companies may require you to work on a shift basis, which could include evenings, nights, and weekends too. Part-time work in this career is uncommon, but some companies will allow for flexible working arrangements.

## Entry Requirements

You'll usually need to complete a degree or degree apprenticeship in a relevant subject like:

- cyber security
- information security
- network security
- ICT
- computer science
- digital and technology solutions
- computing and information systems
- the ability to work under pressure

## Skills Required:

You'll need:

- technical skills, including a knowledge of computer networks, operating systems, software, hardware, and security
- very strong knowledge and understanding of online threats like hacking
- problem-solving and critical thinking skills, to identify and assess threats
- excellent attention to detail, to spot patterns and trends
- the ability to work under pressure, particularly when dealing with threats

Find out more about careers  
on

**UNIFROG**

## Maths for Fun

A	A	A	R	E	P	O	R	P	M	I	T	R
I	X	H	P	E	R	C	E	N	T	I	I	S
S	O	R	R	E	E	R	B	M	A	W	X	R
E	L	F	O	O	D	R	M	I	A	T	E	R
Y	O	F	P	L	N	R	U	P	O	N	D	N
V	T	A	E	N	A	R	N	A	U	U	I	N
A	L	T	R	T	M	R	D	M	E	E	V	A
E	Q	U	I	V	A	L	E	N	T	O	I	N
H	T	O	I	F	L	R	X	C	D	R	D	D
P	F	R	O	T	A	N	I	M	O	N	E	D
O	A	R	M	T	S	I	M	P	L	I	F	Y
T	I	N	O	I	T	C	A	R	F	I	A	A
P	A	R	S	G	V	N	M	X	Y	E	T	N

DENOMINATOR  
 DIVIDE  
 EQUIVALENT  
 FRACTION  
 IMPROPER  
 MIXED NUMBER

NUMERATOR  
 PERCENT  
 PROPER  
 RATIO  
 SIMPLIFY  
 TOP HEAVY

[www.subtangent.com/math](http://www.subtangent.com/math)

Place the numbers 1-9 in every column, row and group of 9 squares (shown by the bold lines). You cannot have repeats in each one.

<b>4</b>		<b>9</b>	<b>1</b>	<b>5</b>		<b>6</b>		<b>8</b>
	<b>8</b>			<b>4</b>		<b>3</b>		<b>1</b>
<b>1</b>	<b>6</b>	<b>2</b>	<b>8</b>	<b>3</b>				
<b>6</b>		<b>5</b>		<b>9</b>		<b>2</b>		<b>7</b>
	<b>9</b>			<b>7</b>			<b>5</b>	
<b>3</b>			<b>2</b>		<b>5</b>		<b>6</b>	
			<b>9</b>			<b>7</b>		<b>5</b>
<b>9</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
				<b>2</b>				