THE DUSTON SCHOOL
Knowledge itself is power
4-19

Year 7 Maths

Knowledge Organiser

Term 3

Name:	Class:

Keyword	Definition
Median	The middle number in an ordered list.
Range	The difference between the smallest and largest values in a data set.
Mean	The sum of all the data divided by how many data there are.
Mode	The most common piece of data.
Average	An indication of the typical value.
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.

Homework 1 due:	
Homework 2 due:	
Homework 3 due:	

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 3 Overview

Big Questions for the term

Fractions, Decimals and Percentages

- How do we represent fractions?
- What do we need to do to compare and order fractions?
- How do we convert between mixed number and improper fractions?
- How do I work out fraction of amounts?
- How do we add and subtract fractions?
- How do we multiply fractions by another fraction?
- How do we divide fractions by fractions?
- Where can we see fractions in other topics?
- What is a percentage?
- How can we use chunking to solve percentage problems?
- How can we convert numbers between fractions, decimals and percentages?

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?

Knowledge Retrieval Questions – From Term 3

Unit 4 – Fractions, Decimals and percentages

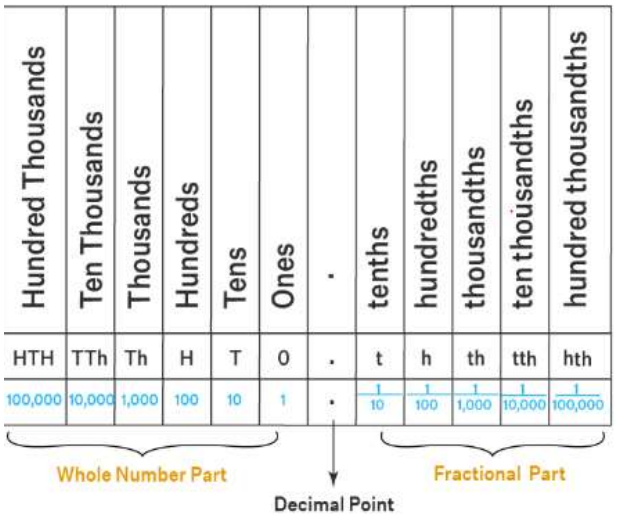
#	Question	Answer
1	What is a numerator?	Top number in a fraction
2	What is a denominator?	Bottom number in a fraction
3	What operation does a fraction represent?	Division
4	Which operation do we use for the word 'of'?	Multiplication
5	What's the first step when adding or subtracting fractions?	Write the fractions with a common denominator
6	How do you multiply fractions?	Multiply the numerators and multiply the denominators.
7	How do you convert a decimal to a percentage?	Multiply by 100 (%)
8	How do you simplify fractions?	Divide both the numerator and denominator by a common factor.
9	How do you find an equivalent fraction?	Multiply or divide the numerator and denominator by the same number.
10	How do you find a fraction of an amount?	Divide the amount by the denominator and multiply by the numerator.
11	What does percent mean?	Out of 100
12	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)
13	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.
14	How do you convert a percentage to a decimal?	Divide by 100 (%)

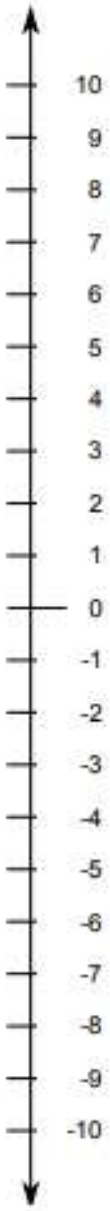
Unit 5 – Ratio and Proportion

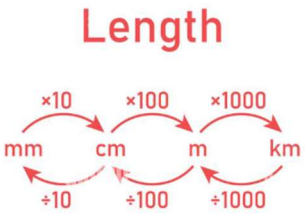
#	Question	Answer
1	How do you simplify a ratio?	Divide both numbers by a common factor.
2	How do you write a ratio into the form 1:n?	Divide both numbers in the ratio by the first number in the ratio.
3	What is the unitary method?	A method where the first step is making the ratio 1:n or n:1
4	How do 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.

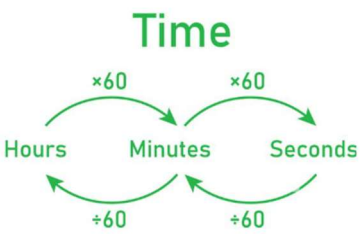
Multiplication Chart

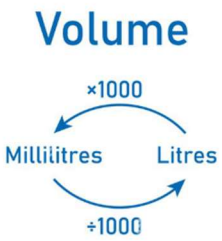
X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	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

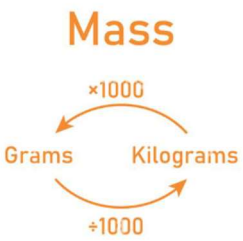












Remote-Learning

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

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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

Username: firstnamesurname@dustonschool

Password: berrywood

Term 3 - Homework 1

#	Type	Question	Answer
1	Knowledge	What is the definition of a multiple?	A number in another number's times table.
	Application 1	Give an example of a multiple of 11	
	Application 2	Give an example of a multiple of 9	
2	Knowledge	What is the definition of a factor?	A number which divides another number exactly.
	Application 1	Give an example of a factor of 12	
	Application 2	Give an example of a factor of 50	
3	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 in the following sequence -10, -12, -14, -16?	
	Application 2	What is the term-to-term rule in the following sequence 4, 1, -2, -5?	
4	Knowledge	How do you convert meters to centimeters?	Multiply by 100
	Application 1	Convert 8m into centimeters	
	Application 2	Convert 17m into centimeters	

#	Type	Question	Answer
5	Knowledge	What is a cube number?	The product of 3 equal numbers.
	Application 1	What is 1 cubed?	
	Application 2	What is 3 cubed?	

6	Knowledge	What sign would the product of a positive and a negative number have?	Negative
	Application 1	What is the product of 2 and -11?	
	Application 2	What is the product of 10 and -10?	

7	Knowledge	What is the definition of a prime number?	A number with only 2 factors.
	Application 1	What is the first prime number?	
	Application 2	What is a prime number between 10 and 20?	

8	Knowledge	How do you convert hours into minutes?	Multiply by 60
	Application 1	Convert 9 hours into minutes	
	Application 2	Convert 12 hours into minutes	

#	Type	Question	Answer
9	Knowledge	How do you convert metres to kilometres?	Divide by 1000
	Application 1	Convert 9800m into km	
	Application 2	Convert 11000m into km	

10	Knowledge	How do you convert millimetres to metres?	Divide by 1000
	Application 1	Convert 9700mm into metres	
	Application 2	Convert 12400mm into metres	

11	Knowledge	How do you subtract decimals?	Same method as usual, lining up the decimal points
	Application 1	Calculate 11.6 – 1.2	
	Application 2	Calculate 18.4 - 11.1	

12	Knowledge	What sign would the product of a negative and a negative number have?	Positive
	Application 1	What is the product of -4 and -10?	
	Application 2	What is the product of -15 and -10?	

Term 3 - Homework 2

#	Type	Question	Answer
1	Knowledge	How do you multiply a number by 10?	Move all the digits 1 place to the left
	Application 1	Evaluate 32 multiplied by 10.	
	Application 2	Evaluate 284 multiplied by 10.	
2	Knowledge	What does LCM stand for?	Lowest Common Multiple
	Application 1	What is the LCM for 10 and 5?	
	Application 2	What is the LCM for 12 and 8	
3	Knowledge	What does consecutive mean?	Following each other continuously.
	Application 1	Select 2 of these numbers which are consecutive: 8, 13, 9, 16.	
	Application 2	Select 2 of these numbers which are consecutive: 16, 21, 18, 20.	
4	Knowledge	How do you find the difference between two numbers?	Subtract the smaller number from the larger one.
	Application 1	What is the difference between 73 and 30?	
	Application 2	What is the difference between 190 and 185?	

#	Type	Question	Answer
5	Knowledge	What should your answer be if the question tells you to calculate?	A number
	Application 1	Calculate 9 multiplied by 3	
	Application 2	Calculate 11 multiplied by 2	

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6	Knowledge	Which operation do we use for the word 'of'?	Multiplication
	Application 1	Write the calculation for 'Two thirds of 54'	
	Application 2	Write the calculation for 'Seven twelfths of 180'	

7	Knowledge	How do you convert metres to kilometres?	Divide by 1000
	Application 1	Convert 800m into km	
	Application 2	Convert 1000m into km	

8	Knowledge	What does the word sum mean?	The result of addition.
	Application 1	What is the sum of 19 and 9?	
	Application 2	What is the sum of 12 and 19?	

#	Type	Question	Answer
9	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 in the following sequence 9, 18, 27, 36, 45?	
	Application 2	What is the term-to-term rule in the following sequence 12, 31, 50, 69, 88?	
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 the 4 in the number 53478?	
	Application 2	What is the value of the 1 in the number 41052?	
11	Knowledge	How do you divide a number by 100?	Move all the digits 2 places to the right
	Application 1	Calculate 76 divided by 100.	
	Application 2	Calculate 136 divided by 100.	
12	Knowledge	How do you convert millimetres to metres?	Divide by 1000
	Application 1	Convert 700mm into metres	
	Application 2	Convert 2400mm into metres	

Term 3 - Homework 3

#	Type	Question	Answer
1	Knowledge	How do you subtract decimals?	Same method as usual, lining up the decimal points
	Application 1	What is the difference between 0.97 and 9.1	
	Application 2	What is the difference between 1.69 and 15.4	
2	Knowledge	What should your answer be if the question tells you to evaluate?	A number
	Application 1	Evaluate 76 + 50	
	Application 2	Evaluate 136 + 195	
3	Knowledge	What is the definition of a factor?	A number which divides another number exactly.
	Application 1	Give an example of a factor of 25	
	Application 2	Give an example of a factor of 32	
4	Knowledge	How do you convert hours into minutes?	Multiply by 60
	Application 1	Convert 4 hours into minutes	
	Application 2	Convert 10 hours into minutes	

#	Type	Question	Answer
5	Knowledge	What is the definition of a multiple?	A number in another number's times table.
	Application 1	Give an example of a multiple of 8	
	Application 2	Give an example of a multiple of 7	

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6	Knowledge	How do you convert litres to millilitres?	Multiply by 1000
	Application 1	Convert 5 litres into millilitres	
	Application 2	Convert 7.5 litres into millilitres	

7	Knowledge	What sign would the product of a negative and a positive number have?	Negative
	Application 1	What is the product of -7 and 9?	
	Application 2	What is the product of -3 and 12?	

8	Knowledge	How do you convert kilograms into tonnes?	Divide by 1000
	Application 1	Convert 3000kg into tonnes	
	Application 2	Convert 4500kg into tonnes	

#	Type	Question	Answer
9	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 the 7 in the number 53478?	
	Application 2	What is the value of the 1 in the number 41052?	

10	Knowledge	How do you divide a number by 10?	Move all the digits 1 place to the right
	Application 1	Calculate 6 divided by 10.	
	Application 2	Calculate 36 divided by 10.	

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 5^{th} square number	
	Application 2	What is the 13^{th} square number	

12	Knowledge	What does HCF stand for?	Highest Common Factor
	Application 1	What is the HCF of 10 and 20?	
	Application 2	What is the HCF of 16 and 20	

Meteorologist

Meteorologists collect and study data to make weather forecasts.

You'll specialise in forecasting or research.

As a forecaster you'll:

- collect data from satellite images, radar, remote sensors and weather stations
- measure air pressure, wind, temperature and humidity
- predict the weather by analysing information and using computer programmes
- give weather information and reports to customers

As a researcher you'll:

- study weather patterns and climate change
- improve computer predictions
- use research to predict floods
- study how the weather affects the spread of pollution or disease
- collecting national and international data

Working Hours and Environment

As a forecaster or observer you'll work 30 to 40 hours a week, including shifts and at weekends.

As a researcher you'll work 30 to 40 hours a week, Monday to Friday.

You'll work in an office, but may sometimes have to travel to remote places, or to attend conferences in the UK and overseas.

Skills Required:

You'll need:

- the ability to analyse and present complex data
- excellent mathematical and computing skills
- excellent written and verbal communication skills

Entry Requirements

You'll usually need a degree in a related subject like:

- Physics
- Maths
- Environmental studies
- Geography
- Computer science

The Met Office offers some summer placements, work experience positions, and has more information about becoming a meteorologist.

Find out more about careers on **UNIFROG**

Maths for Fun

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

DOUBLE
EQUAL
FRACTION
MIXTURE
PROPORTION
RATIO
SHARE
SIMPLIFY
TRIPLE
UNITARY

www.subtangent.com/maths

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.

4	3	9		5				
6	8			3	7		4	
1	7	5	8	4		2	9	3
3	9		6	8	1	7		2
7			3		5			
		8			4	1		
8		3	2	1			7	5
	1	7	5		8			4
5	2		4		3		1	8