

# Year 7 Maths

## Knowledge Organiser

### Term 2

<b>Name:</b>	<b>Class:</b>
--------------	---------------

Keyword	Definition
Numerator	The top number in a fraction.
Denominator	The bottom number in a fraction.
Improper Fraction	A fraction where the numerator is not smaller than the denominator.
Mixed Number	A combination of a whole number and a fraction.
Product	The result of multiplication.
Percent	Out of 100
Simplify	To make simpler or easier to understand by reducing the size of numbers or the number of terms.
Reciprocal	The result of dividing 1 by the number.

<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 2 Overview

### Big Questions for the term

#### Measures

- What are the metric units for length?
- What are the metric units for volume and mass?
- How do we convert time?

#### 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?

## Knowledge Retrieval Questions – Term 2

### Unit 3 - Measures

#	Question	Answer
1	How do you convert millimetres to metres?	Divide by 1000
2	How do you convert metres to centimetres?	Multiply by 100
3	How do you convert metres to kilometres?	Divide by 1000
4	How do you convert hours into minutes?	Multiply by 60
5	How do you convert seconds into minutes?	Divide by 60
6	How do you convert kilograms into grams?	Multiply by 1000
7	How do you convert kilograms into tonnes?	Divide by 1000
8	How do you convert litres to millilitres?	Multiply by 1000

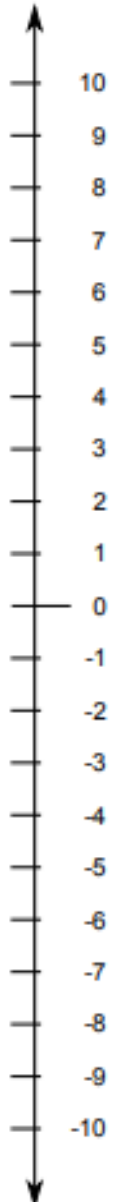
### Unit 4 – Fractions, Decimals and percentages

#	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 (%)

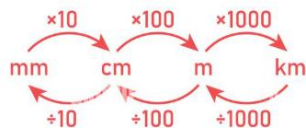
## Multiplication Chart

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

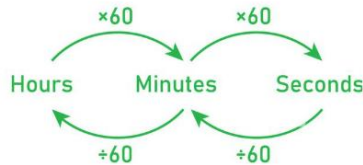
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	.	tenths	hundredths	thousandths	ten thousandths	hundred thousandths
HTH	TTh	Th	H	T	0	.	t	h	th	tth	hth
100,000	10,000	1,000	100	10	1	.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1,000}$	$\frac{1}{10,000}$	$\frac{1}{100,000}$
Whole Number Part						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 2 - 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 10	
	Application 2	Give an example of a multiple of 19	

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 27	
	Application 2	Give an example of a factor of 91	

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 8, 15, 22, 29?	
	Application 2	What is the term-to-term rule in the following sequence 16, 33, 50, 67?	

4	Knowledge	What does the word product mean?	The result of a multiplication.
	Application 1	What is the product of 8 and 10?	
	Application 2	What is the product of 9 and 11?	

#	Type	Question	Answer
5	Knowledge	What is a cube number?	The product of 3 equal numbers.
	Application 1	What is 2 cubed?	
	Application 2	What is 4 cubed?	

6	Knowledge	What sign would the product of a positive and a negative number have?	Negative
	Application 1	What is the product of 8 and -10?	
	Application 2	What is the product of 15 and -10?	

7	Knowledge	How do you add decimals?	Same method as usual, lining up the decimal points
	Application 1	Calculate $6.2 + 9.61$	
	Application 2	Calculate $18.4 + 6.92$	

8	Knowledge	What sign would the product of 2 negative numbers have?	Positive
	Application 1	What is the product of -10 and -10?	
	Application 2	What is the product of -19 and -8?	

#	Type	Question	Answer
9	Knowledge	What does HCF stand for?	Highest Common Factor
	Application 1	What is the HCF of 12 and 6?	
	Application 2	What is the HCF of 72 and 80?	

10	Knowledge	What is the definition of a square number?	The product of a number and itself
	Application 1	What is the 10th square number?	
	Application 2	What is the 12th square number?	

11	Knowledge	How do you subtract decimals?	Same method as usual, lining up the decimal points
	Application 1	Calculate $9.6 - 6.2$	
	Application 2	Calculate $18.4 - 16.53$	

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

**Term 2 - Homework 2**

#	Type	Question	Answer
1	Knowledge	What is the definition of a factor?	A number which divides another number exactly.
	Application 1	Give an example of a factor of 15	
	Application 2	Give an example of a factor of 126	

2	Knowledge	What sign would the product of 2 negative numbers have?	Positive
	Application 1	What is the product of -8 and -7?	
	Application 2	What is the product of -14 and -3?	

3	Knowledge	What is adding a negative number equivalent to?	Subtracting a positive number
	Application 1	Evaluate $6 + (-10)$	
	Application 2	Evaluate $16 + (-18)$	

4	Knowledge	What sign would the product of a positive and a negative number have?	Negative
	Application 1	What is the product of 3 and -7?	
	Application 2	What is the product of 17 and -7?	

#	Type	Question	Answer
5	Knowledge	What does HCF stand for?	Highest Common Factor
	Application 1	What is the HCF of 7 and 8?	
	Application 2	What is the HCF of 42 and 42?	

6	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 14	

7	Knowledge	What is a linear sequence?	A number pattern which increases or decreases by the same amount each time.
	Application 1	Is the following sequence linear? 4, 6, 6, 8	
	Application 2	Is the following sequence linear? 21, 44, 70, 93	

8	Knowledge	What is the definition of a prime number?	A number with only 2 factors.
	Application 1	Is the number 5 prime?	
	Application 2	Is the number 18 prime?	

#	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 62 multiplied by 10.	
	Application 2	Evaluate 184 multiplied by 10.	

10	Knowledge	What is the definition of a square number?	The product of a number and itself
	Application 1	What is the 4th square number?	
	Application 2	What is the 20th square number?	

11	Knowledge	How do you subtract decimals?	Same method as usual, lining up the decimal points
	Application 1	Calculate $12.6 - 6.2$	
	Application 2	Calculate $23.4 - 16.13$	

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

### Term 2 - Homework 3

#	Type	Question	Answer
1	Knowledge	In a sequence, what is meant by a term?	One of the numbers in the sequence
	Application 1	What is the third term in the following sequence? 63, 76, 89, 102, 115	
	Application 2	What is the third term in the following sequence? 185, 370, 555, 740, 925	

2	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 18 multiplied by 2	

3	Knowledge	How do you multiply a number by 10?	Move all the digits 1 place to the left
	Application 1	Evaluate 13 multiplied by 10.	
	Application 2	Evaluate 185 multiplied by 10.	

4	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?	

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

6	Knowledge	What should your answer be if the question tells you to evaluate?	A number
	Application 1	Evaluate $63 + 31$	
	Application 2	Evaluate $185 + 189$	

7	Knowledge	What is the definition of a factor?	A number which divides another number exactly.
	Application 1	Give an example of a factor of 15	
	Application 2	Give an example of a factor of 12	

8	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 20	

#	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 3 in the number 53478?	
	Application 2	What is the value of the 4 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 86 divided by 10.	
	Application 2	Calculate 236 divided by 10.	

11	Knowledge	How do you subtract decimals?	Same method as usual, lining up the decimal points
	Application 1	Calculate $19.6 - 6.2$	
	Application 2	Calculate $22.4 - 16.1$	

12	Knowledge	What sign would the product of a negative and a positive number have?	Negative
	Application 1	What is the product of -1 and 10?	
	Application 2	What is the product of -3 and 10?	



# Astronaut

*Astronauts are trained to fly, or be crew members of, spacecraft.*

You'll maintain the spacecraft and make sure you can live safely onboard. You'll also carry out scientific experiments and research.

Your duties could include:

- cleaning and testing air filters and air quality
- repairing, maintaining and testing oxygen production systems
- cleaning and maintaining water systems and testing for bacterial growth
- packaging and disposing of waste
- replacing worn or broken parts on the spacecraft
- installing or repairing scientific instruments and equipment
- setting up, carrying out and monitoring experiments
- taking samples, like blood, from astronauts to assess their health
- communicating with Earth by satellite to transfer data and send reports

## Working Hours and Environment

- On a mission you'll work to a set schedule.
- You'll be away from home for extended periods of time.
- You'll need to travel overseas for training.
- You'll need a high level of physical fitness to help you cope with life in space, because of the cramped living conditions and the effects of low gravity on your body.

## Skills Required:

You'll need:

- excellent scientific or flight skills
- excellent physical and psychological strength to live in confined spaces for long periods
- the ability to stay calm during an emergency
- determination
- adaptability and good judgement

## Entry Requirements

Opportunities to become an astronaut are very limited and competition for places is very strong.

You'll usually need to be aged 27 to 37 and able to speak English fluently. It would also help if you could speak a second language, like basic Russian.

You'll also need to be a pilot with at least 1,000 hours of flying experience in a high-performance aircraft like a fighter jet, or have a PhD in a subject like biology, chemistry, engineering, information technology, mathematics, or physics. With either of these routes, you'll usually need 3 years' experience.

## Maths For Fun

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

CUBE  
DIVIDES  
FACTOR  
FORMULA  
INTEGER

MULTIPLE  
PATTERN  
PERFECT  
SQUARE  
TRIANGULAR

[www.subtangent.com/maths](http://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.

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