THE DUSTON SCHOOL
Knowledge itself is power
TDS 4-19

Year 7 Maths
Knowledge Organiser
Term 6

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.
Qualitative	Data which is non-numerical.
Quantitative	Data which is numerical.
Discrete	Data which can only take certain values in a range.
Continuous	Data which can take any value in a range.
Frequency	How often something happens
Systematic	Involving a method or plan.
Outcome	A possible result of an experiment.
Mutually exclusive	Describes two events which cannot happen together.
Relative frequency	An estimate of probability based on observation or experiment.
Experiment	A procedure that can be repeated which has a well-defined set of outcomes.
Event	A set of outcomes of an experiment.
Probability	The likelihood of something happening.
Sample Space diagram	A diagram showing all the possible outcomes of an experiment.
Median	The middle number in an ordered list.
Range	The difference between the smallest and largest values in a data set.

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

Term 6 Overview

Big Questions for the term

Data

- How can we record data?
- What is an average?
- How can we compare data using a bar chart?
- How do we use a stem and leaf diagram?
- How does a Pie Chart represent Data?
- What is a set?
- How can we use Venn diagrams to categorise numbers and objects?

Probability

- How do we represent probabilities of events?
- How do we systematically list the outcomes of an experiment
- What does it mean for events to be mutually exclusive?
- How can we represent and work out problems involving mutual exclusivity?

Knowledge Retrieval Questions – From Term 1

Unit 1 – Calculations and Accuracy

#	Question	Answer
1	What does the word sum mean?	The result of addition.
2	What does consecutive mean?	Following each other continuously.
3	How do you find the difference between two numbers?	Subtract the smaller number from the larger one.
4	What should your answer be if the question tells you to calculate?	A number
5	What should your answer be if the question tells you to evaluate?	A number
6	How do you divide a number by 10?	Move all the digits 1 place to the right
7	How do you multiply a number by 10?	Move all the digits 1 place to the left
8	What is subtracting a negative number equivalent to?	Adding a positive number
9	What is adding a negative number equivalent to?	Subtracting a positive number
10	What is a term-to-term rule?	A rule telling you how to get from one term to the next in a sequence
11	In a sequence, what is meant by a term?	One of the numbers in the sequence
12	What is the first step when trying to find the next term in a sequence?	Identify the pattern.
13	What is a linear sequence?	A number pattern which increases or decreases by the same amount each time.
14	How do you work out the value of a digit in a long number?	Ignore every other digit (make them zeroes)
15	How do you add decimals?	Same method as usual, lining up the decimal points
16	How do you subtract decimals?	Same method as usual, lining up the decimal points

Unit 2 – Integers, Powers and Roots

#	Question	Answer
1	What does the word product mean?	The result of a multiplication.
2	What sign would the product of 2 negative numbers have?	Positive
3	What sign would the product of a positive and a negative number have?	Negative
4	What sign would the answer to a negative number divided by a positive number have?	Negative
5	What is the definition of a square number?	The product of a number and itself
6	List the first 15 square numbers.	1,4,9,16,25,36,49,64,81,100,121,144,169,196,225
7	What is the definition of a factor?	A number which divides another number exactly.
8	What is the definition of a multiple?	A number in another number's times table.
9	What does HCF stand for?	Highest Common Factor
10	What does LCM stand for?	Lowest Common Multiple
11	What is a cube number?	The product of 3 equal numbers.
12	How do you divide by a fraction?	Multiply by its reciprocal (the fraction flipped over)

Knowledge Retrieval Questions – From 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 convert a mixed number to an improper fraction?	Multiply the whole number by the denominator and add it to the numerator
11	How do you find a fraction of an amount?	Divide the amount by the denominator and multiply by the numerator.
12	What does percent mean?	Out of 100
13	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)
14	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.
15	How do you convert a percentage to a decimal?	Divide by 100 (%)

Knowledge Retrieval Questions – From Term 3

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.

Knowledge Retrieval Questions – From Term 4

Unit 7 – Lines, Angles and Shapes

#	Question	Answer
1	What do the exterior angles of a polygon add up to?	360 degrees
2	What do the angles in a triangle add to?	180 degrees
3	What do the angles in a quadrilateral add up to?	360 degrees
4	What is special about adjacent and opposite angles in a parallelogram?	Adjacent angles sum to 180 degrees, opposite angles are equal.
5	List the types of angles in order of size	Acute, Right, Obtuse, Reflex
6	What do angles which make a straight line sum to?	180 degrees
7	What do angles around a point sum to?	360 degrees
8	How do you work out what the interior angles of a polygon add up to?	Count the sides, subtract 2, multiply by 180.

Knowledge Retrieval Questions – From Term 5

Unit 8 – Area and Perimeter

#	Question	Answer
1	State the properties of a square.	4 edges, all equal length, 4 right angles.
2	State the two properties of a trapezium.	Quadrilateral with one pair of parallel edges
3	What is a vertex?	A point where edges meet
4	State the properties of a parallelogram.	Quadrilateral with 2 pairs of parallel edges.
5	What is the formula for calculating the area of a rectangle?	Area = base × height
6	How do you work out the perimeter of a 2D shape?	Add all the edge lengths
7	What is the formula for calculating the area of a triangle?	1/2 x base x height
8	How do you work out the height of a rectangle if you know the area and the base length?	Area ÷ Base length
9	What is the formula for calculating the area of a trapezium?	Area = ½ × (a+b) × height
10	What is the formula for working out the area of a parallelogram?	Area = base × height
11	What are the properties of a rectangle?	Quadrilateral with 2 pairs of parallel edges and 4 right angles.
12	What is the formula for working out the area of a square?	Area = base²
13	How do you work out the height of a triangle if you know the area and the base length?	2 x Area ÷ Base length

Knowledge Retrieval Questions – From Term 6

Unit 9 – Data

#	Question	Answer
1	How do you find the mean of a set of data?	Divide the total of the values by the number of values
2	How do you find the mode of a set of data?	Identify the most frequent piece of data
3	What is qualitative data?	Data which isn't in numeric form.
4	What is quantitative data?	Data which is in numeric form.
5	What is discrete data?	Quantitative data which can only take certain values.
6	What is continuous data?	Quantitative data which can take any value.

Unit 10 – Probability

#	Question	Answer
1	What is the sum of the probabilities of all possible outcomes?	1
2	State the ways you can give the probability of something happening.	Fraction, decimal and percentage.
3	What does it mean if A and B are mutually exclusive?	They cannot both occur.
4	How do you work out the probability of an outcome as a fraction?	The numerator is the number of ways of it happening and the denominator is the total.

Term 6 Homework 1

#	Type	Question	Answer
1	Knowledge	How is division represented algebraically?	
	Application 1	How do you write b divided by 5 algebraically?	
	Application 2	How do you write 18 divided by c algebraically?	
2	Knowledge	In algebra, what is substitution?	
	Application 1	Evaluate 9x + 2y, if x = 3 and y = 5	
	Application 2	Evaluate 15x + 20y, if x = 11 and y = 18	
3	Knowledge	How do you work out the height of a triangle if you know the area and the base length?	
	Application 1	Calculate the height of a triangle with an area of 40cm² and a base length of 5cm.	
	Application 2	Calculate the height of a triangle with an area of 85cm² and a base length of 5cm.	
4	Knowledge	How do you work out the perimeter of a 2D shape?	
	Application 1	Calculate the perimeter of a rectangle with dimensions 9cm and 2cm.	
	Application 2	Calculate the perimeter of a rectangle with dimensions (3a) cm and (5a) cm.	
5	Knowledge	What is the formula for calculating the area of a rectangle?	
	Application 1	Calculate the area of a rectangle with dimensions 9cm and 2cm.	
	Application 2	Calculate the area of a rectangle with dimensions 15cm and 20cm.	

#	Type	Question	Answer
6	Knowledge	State the properties of a square.	
	Application	Sketch a square, using the appropriate symbols.	
7	Knowledge	What is the formula for working out the area of a parallelogram?	
	Application 1	Calculate the area of a paralellogram with dimensions 4cm and 3cm.	
	Application 2	Calculate the area of a paralellogram with dimensions 11cm and 19cm.	
8	Knowledge	How do you calculate best value?	
	Application 1	SHOW which is better value, Shop A: 5 pens for 15p, or Shop B: 7 pens for 14p	
	Application 2	SHOW which is better value, Shop A: 18 pens for 198p, or Shop B: 20 pens for 240p?	
9	Knowledge	How do you write expressions from sentences?	
	Application 1	Write '3 lots of a number minus 5' as an expression.	
	Application 2	Write '15 more than k' as an expression.	
10	Knowledge	How do you work out the height of a rectangle if you know the area and the base length?	
	Application 1	Calculate the height of a rectangle with an area of $15cm^2$ and a base length of 5cm.	
	Application 2	Calculate the height of a triangle with an area of $198cm^2$ and a base length of 18cm.	

#	Type	Question	Answer
11	Knowledge	How do you simplify a ratio?	
	Application 1	Fully simplify 6:30	
	Application 2	Fully simplify 30:108	
12	Knowledge	State the properties of a parallelogram.	
	Application	Sketch a paralellogram, using the appropriate symbols.	
13	Knowledge	What is the unitary method?	
	Application 1	9 pens cost 135p. Work out the cost of 10 pens.	
	Application 2	15 pens cost 300p. Work out the cost of 16 pens.	
14	Knowledge	State the two properties of a trapezium.	
	Application	Sketch a trapezium, using the appropriate symbols.	
15	Knowledge	How do you share an amount in a ratio?	
	Application 1	Share 63 into the ratio 2:5	
	Application 2	Share 180 into the ratio 9:3	

#	Type	Question	Answer
16	Knowledge	What is the formula for calculating the area of a trapezium?	
	Application 1	Calculate the area of this trapezium: 2 parallel edges with lengths of 5 cm and 11 cm. Two diagonal lines of length 4 cm and 5 cm and a height of 3 cm.	
	Application 2	Calculate the area of this trapezium: 2 parallel edges with lengths of 8 cm and 10 cm. Two diagonal lines of length 5 cm and 6 cm and a height of 4 cm.	
17	Knowledge	What are the properties of a rectangle?	
	Application	Sketch a rectangle, using the appropriate symbols.	
18	Knowledge	What is a vertex?	
	Application	Sketch a shape and draw an arrow pointing to a vertex.	
19	Knowledge	In algebra, what does "collecting like terms" mean?	
	Application 1	Simplify the following expression: 10p + 9q - 2p + 3q	
	Application 2	Simplify the following expression: 20p + 15q - 20p + 11q	
20	Knowledge	What is the formula for calculating the area of a triangle?	
	Application 1	Calculate the area of a triangle with dimensions 9cm and 2cm.	
	Application 2	Calculate the area of a triangle with dimensions 15cm and 20cm.	

Workings Space

Term 6 Homework 2

#	Type	Question	Answer
1	Knowledge	What does the word product mean?	
	Application 1	What is the product of 6 and 9?	
	Application 2	What is the product of 7 and 17?	
2	Knowledge	How do you divide a number by 10?	
	Application 1	Calculate 96 divided by 10.	
	Application 2	Calculate 160 divided by 10.	
3	Knowledge	What should your answer be if the question tells you to evaluate?	
	Application 1	Evaluate 96 + 46	
	Application 2	Evaluate 160 + 132	
4	Knowledge	How do you convert kilograms into grams?	
	Application 1	Convert 2.1kg into grams	
	Application 2	Convert 17.4kg into grams	
5	Knowledge	How do you convert millimetres to metres?	
	Application 1	Convert 4600mm into metres	
	Application 2	Convert 11500mm into metres	

#	Type	Question	Answer
6	Knowledge	How do you multiply fractions?	
	Application 1	Calculate 1/20 × 6/10	
	Application 2	Calculate 15/180 × 18/70	
7	Knowledge	What does the word sum mean?	
	Application 1	What is the sum of 7 and 1?	
	Application 2	What is the sum of 12 and 15?	
8	Knowledge	What is the definition of a square number?	
	Application 1	What is the 5th square number?	
	Application 2	What is the 20th square number?	
9	Knowledge	How do you find the difference between two numbers?	
	Application 1	What is the difference between 96 and 21?	
	Application 2	What is the difference between 160 and 174?	
10	Knowledge	What is a linear sequence?	
	Application 1	Is the following sequence linear? 2, 4, 9, 11	
	Application 2	Is the following sequence linear? 20, 40, 62, 82	

#	Type	Question	Answer
11	Knowledge	How do you convert metres to kilometres?	
	Application 1	Convert 6400m into km	
	Application 2	Convert 19400m into km	

12	Knowledge	What is a term-to-term rule?	
	Application 1	What is the term-to-term rule in the following sequence 7, 8, 9, 10, 11?	
	Application 2	What is the term-to-term rule in the following sequence 12, 27, 42, 57, 72?	

13	Knowledge	How do you subtract decimals?	
	Application 1	What is the difference between 0.64 and 4.6	
	Application 2	What is the difference between 1.94 and 11.5	

14	Knowledge	In a sequence, what is meant by a term?	
	Application 1	What is the third term in the following sequence? 96, 117, 138, 159, 180	
	Application 2	What is the third term in the following sequence? 160, 334, 508, 682, 856	

15	Knowledge	What is the definition of a prime number?	
	Application 1	Is the number 7 prime?	
	Application 2	Is the number 12 prime?	

#	Type	Question	Answer
16	Knowledge	What does HCF stand for?	
	Application 1	What is the HCF of 24 and 24?	
	Application 2	What is the HCF of 115 and 100?	
17	Knowledge	What does percent mean?	
	Application 1	Write 64% as a fraction.	
	Application 2	Write 194% as a fraction.	
18	Knowledge	What is the definition of a factor?	
	Application 1	Give an example of a factor of 21	
	Application 2	Give an example of a factor of 84	
19	Knowledge	What is the definition of a multiple?	
	Application 1	Give an example of a multiple of 9	
	Application 2	Give an example of a multiple of 17	
20	Knowledge	How do you convert seconds into minutes?	
	Application 1	Convert 360 seconds into minutes	
	Application 2	Convert 1080 seconds into minutes	

Workings Space

Term 6 Homework 3

#	Type	Question	Answer
1	Knowledge	How do you work out the probability of an outcome as a fraction?	
	Application 1	In a bag there are 7 red, 8 blue and 4 green marbles. What is the probability of selecting a red marble at random?	
	Application 2	In a bag there are 17 red, 12 blue and 16 green marbles. What is the probability of selecting a red marble at random?	
2	Knowledge	What is qualitative data?	
	Application	Give an example of a question on a questionnaire, the answer of which would provide qualitative data.	
3	Knowledge	What is quantitative data?	
	Application	Give an example of a question on a questionnaire, the answer of which would provide quantitative data.	
4	Knowledge	What is continuous data?	
	Application	Give an example of a question on a questionnaire, the answer of which would provide continuous data.	
5	Knowledge	What is discrete data?	
	Application	Give an example of a question on a questionnaire, the answer of which would provide discrete data.	

#	Type	Question	Answer
6	Knowledge	What does it mean if A and B are mutually exclusive?	
	Application 1	In an experiment, a student rolls two dice and says, at least one of the dice is even and the sum of the dice is 9. Is this possible?	
	Application 2	In an experiment, a student rolls two dice and says, at least one of the dice is odd and at least one of the dice is even. Are these events mutually exclusive?	
7	Knowledge	State the ways you can give the probability of something happening.	
	Application 1	Write the probability of an event described as even chance in each of those ways.	
	Application 2	State the probability of an event described as impossible.	
8	Knowledge	What is the sum of the probabilities of all possible outcomes?	
	Application 1	In an experiment, a student spins a spinner labelled A, B, C. The probability of getting A is 0.4, the probability of getting B is 0.4. What is the probability of getting C?	
	Application 2	In an experiment, a student spins a spinner labelled A, B, C. The probability of getting A is 0.33, the probability of getting B is 0.13. What is the probability of getting C?	
9	Knowledge	How do you find the mean of a set of data?	
	Application 1	Find the mean of these data: 7, 8, 4, 8, 17	
	Application 2	Find the mean of these data: 17, 12, 16, 13, 27	
10	Knowledge	How do you find the mode of a set of data?	
	Application 1	Find the mode of these data: 1, 1, 1, 1, 2, 1, 8, 1, 1, 1	
	Application 2	Find the mode of these data: 16, 15, 15, 12, 16, 20, 13, 15, 15, 12, 15	

Workings Space