

## Mathematics Transition Booklet An Introduction to Year 7



Name:

This booklet will help to prepare you for your maths lessons when you join us in September.

Complete as many different tasks as you can over summer and bring the booklet with you in September to show your maths teachers and you could achieve your first Pleckgate achievement points. If you fancy an extra challenge there are some mind boggling maths problems at the end, which will really make you think.

Try to do around 30 minutes each day. Don't forget you can use useful websites to help you such as BBC Bitesize.

Have a good summer and see you in September.





Tom and Nadia have 16 cards each.

Tom gives Nadia 12 of his cards.

1

How many cards do Tom and Nadia each have now?

Nadia



## **BOOSTER WORKBOOK**

# **Calculation C4**

Add and subtract to solve problems

1

Lucy also has 16 cards.

She gives a quarter of her cards to Kiran.

How many cards does Lucy give to Kiran?

1 mark



Leon and Sara each started with different numbers.



Leon and Sara both get the **same** answer.

What numbers could they have started with?



3

Sapna and Robbie have some biscuits.

Altogether they have 14 biscuits.

Sapna has 2 more biscuits than Robbie.

How many biscuits do Sapna and Robbie each have?



1 mark

3





p + q = 1000

**p** is 150 **greater** than **q**.

Calculate the numbers **p** and **q**.



5

**BOOSTER WORKBOOK** 

# **Calculation C5**

Properties of number









2 marks



Write these numbers in the correct places on the Venn diagram.

Some numbers are already placed.







6

10 Write these numbers in the correct places on the diagram.

5 6 7 8

2 marks



Here is a sorting diagram with four sections, A, B, C and D.

11

	multiple of 10	not a multiple of 10
multiple of 20	А	В
not a multiple of 20	с	D

#### Write a number that could go in section C.



8

12

Here is a diagram for sorting numbers.

Write one number in each white section of the diagram.

	less than 1000	1000 or more
multiples of 20		
not multiples of 20		

Section **B** can never have any numbers in it.







2 marks

2 marks







Debbie has a pack of cards numbered from 1 to 20

She picks four different number cards.



Exactly three of the four numbers are multiples of 5 Exactly three of the four numbers are even numbers. All four of the numbers add up to less than 40

Write what the numbers could be.

**BOOSTER WORKBOOK** 

# **Calculation C7**

Multiply and divide using written methods







Calculate 509 × 24 17 multiplied by itself gives a **3-digit** answer. 5 N 7 7 2 8 9 1 × 1 = Show your working. What is the smallest 2-digit number that can be You may get multiplied by itself to give a 4-digit answer? a mark. × = 1 mark

4

6



2 marks









12

=

=

=

3



45

60

(4 × 5)

Write in the missing numbers.

+

x



1 mark

1 mark

## **BOOSTER WORKBOOK**

# **Calculation C8**

Solve problems all four operations





3

Draw a line from each card to the correct part of the number line.

One has been done for you. You may use a calculator.





















Alan has 45 beans.

He plants 3 beans in each of his pots.

How many pots does he need?

pots

1 mark

1 mark

She says, 'Add 3 to my number and then multiply the result by 5 The answer is 35' What is Jemma's number? Name and the says, 'Halve my number and then add 17 The answer is 23'

What is Riaz's number?

Jemma thinks of a number.

16



1 mark

Leila puts 4 seeds in each of her pots.

She uses 6 pots and has 1 seed left over.

How many seeds did she start with?





2 marks





Josh thinks of a number.

He adds 4

He multiplies his result by 3

Then he takes away 9

His final answer is 90

What number did Josh start with?



1 mark

20 The signs are missing from these number sentences.

Write in the missing signs,  $+ - \times$  or  $\div$ 

The first has been done for you.



1 mark







# **Calculation C9**

Order of operations



1 mark







3 Calculate 900 ÷ (45 × 4)



2 marks

1 mark

4	Calculate	1.2 × (1.3 + 1.4	) × 1.5	
			Ø	]





# Fractions,% and Decimals F4

Add and subtract fractions





Here is part of a number line.

Write in the two missing numbers.



1 mark

3

1 mark

**BOOSTER WORKBOOK** 

# Fractions,% and Decimals F9

Multiply and divide with decimals









7.4	8.1	9.4

10

Which two of these numbers, when multiplied together, have the answer closest to 70?



1 mark

4

6

#### Write the answer to each of these calculations rounded to the nearest whole number.

One has been done for you.

	to the nearest whole number
75.7 × 59	4466
7734 ÷ 60	
772.4 × 9.7	
20.34 × (7.9 – 5.4)	

20ii

20i

2 marks







A bottle holds 1 litre of lemonade.

1

Rachel fills **5** glasses with lemonade. She puts **150 millilitres** in each glass.

How much lemonade is left in the bottle?



**BOOSTER WORKBOOK** 

# Measurement M5

Convert between metric units (see also M9)

1

2 marks



This table shows the weight of some fruits and vegetables.

#### Complete the table.

N		grams	kilograms
	potatoes	3500	3.5
	apples		1.2
	grapes	250	
	ginger		0.03

2 marks

3

15

## **BOOSTER WORKBOOK**

# Measurement M7

**Perimeter and area** 



Match each shape on the left to one with **equal area** on the right.

One has been done for you.



2

Draw a rectangle on the grid that has **half** the area of the shaded triangle.

Use a ruler.



1 mark

2 marks



#### Here is a 1cm square grid.

#### Some of the grid is shaded.



What is the **area** that is shaded?



1 mark

4

Here is a grid of regular hexagons.

4

The shaded shape has an area of 3 hexagons and a perimeter of 14 cm.

Draw another shape on the grid which has an **area** of 4 hexagons and a **perimeter** of 14 cm.







Millie has some star-shaped tiles.



N

She puts two tiles together to make this shape.



Work out the perimeter of Millie's shape.



1 mark

6

Here is a triangle drawn on a square grid.

Draw a **rectangle** on the grid with the **same area** as the triangle.

Use a ruler.

6



1 mark









#### Lauren has three small equilateral triangles and one large equilateral triangle.

The small triangles have sides of 7 centimetres.

Lauren makes this shape.



Do not use a ruler.



1 mark



An isosceles triangle has a perimeter of 12cm.

One of its sides is 5cm.

What could the length of each of the other two sides be?

Two different answers are possible.

Give **both** answers.





2 marks









Here is a rectangle with a width of 15.7 centimetres.



#### The **perimeter** of this rectangle is 85 centimetres.



14

This is a centimetre grid.

Draw  ${\bf 3}\ {\bf more\ lines\ }$  to make a parallelogram with an area of  ${\bf 10cm^2}$ 

Use a ruler.





Here is an equilateral triangle inside a square.



The perimeter of the triangle is 48 centimetres.





16

A white square is painted in one corner of a grey square.

Each side of the white square is **half** the length of a side of the grey square.



What is the area of the grey section?







**BOOSTER WORKBOOK** 

# Ratio and Proportion R2

Use of percentages for comparison

2

1

Here is a pattern on a grid.



What percentage of the grid is shaded?



1 mark









Not drawn to scale

The distance from A to B is three times as far as from B to C.

The distance from A to C is 60 centimetres.

Calculate the distance from A to B.

## Show your **method**. You may get a mark. cm

2 marks

## **BOOSTER WORKBOOK**

# Ratio and Proportion R3

Scale factors





There are 24 coloured cubes in a box.

Three-quarters of the cubes are red, four of the cubes are blue and the rest are green.



How many green cubes are in the box?

## **BOOSTER WORKBOOK**

# Ratio and Proportion R4

Unequal sharing and grouping

1

Show your method. You may get a mark.

2 marks

One more **blue** cube is put into the box.

2 Calculate  $\frac{3}{4}$  of 840





Mari is the presenter of a weekly radio show.



She always plays **five** new songs for every **two** old songs.

Last week she played 15 **new** songs.

How many songs did she play altogether?





Calculate  $\frac{3}{4}$  of £15





Peanuts cost 60p for 100 grams.

3



Raisins cost 80p for 100 grams.

Jack pays **£2** for a bag of raisins.

How many grams of raisins does he get?



3

15b

2 marks





oranges

2 marks





11

12

Calculate  $\frac{5}{12}$  of 378

What is the number?

Three-quarters of a number is 48



1 mark

2 marks





Here is part of a number sequence.

The numbers increase by the same amount each time.



The sequence continues.

Circle **all** of the numbers below that would appear in the sequence.

## **840 905 989 1000 2051**

## **BOOSTER WORKBOOK**

# Algebra A3

Generate and describe linear number sequences



Hayley makes a sequence of numbers.

#### Her rule is

#### 'find half the last number then add 10'

Write in the next two numbers in her sequence.

36	28	24	

2 marks



4

Here is a repeating pattern of shapes.

Each shape is numbered.



The pattern continues in the same way.

Write the numbers of the next two **stars** in the pattern.

and

Complete this sentence.

Shape number 35 will be a circle because ...

The numbers in this sequence increase by the same amount each time.

Write in the missing numbers.





1 mark





Every third number in the chart has a circle on it.



The chart continues in the same way. Here is another row in the chart.



6 In this sequence each number is double the previous number.Write in the missing numbers.



The first two numbers in this sequence are 2.1 and 2.2

7

The sequence then follows the rule

'to get the next number, add the two previous numbers'

Write in the next two numbers in the sequence.



2 marks

6

2 marks













## **BOOSTER WORKBOOK**

# Algebra A4

Number sentences involving two unknowns



#### A shop sells notebooks and pens.

1



Hassan bought **a notebook** and **a pen**. He paid **£1.10** 

Kate bought a notebook and 2 pens. She paid £1.45

#### Calculate the cost of **a notebook**.



2



30 children are going on a trip.

It costs **£5** including lunch.

Some children take their own packed lunch.

They pay only **£3** 

The 30 children pay a total of **£110** 

How many children are taking their own packed lunch?



2 marks



## Puzzles and problems for Years 5 and 6

#### Square it up

short.

You need six drinking straws each the same length. Cut two of them in half. You now have eight straws, four long and four

You can make 2 squares from the eight straws.



Arrange your eight straws to make 3 squares, all the same size.

53

**Teaching objectives** Solve mathematical problems or puzzles.

Visualise 2-D shapes.



#### Joins

Join any four numbers. Find their total.

Joins can go up, down or sideways, but not diagonally. The score shown is 8 + 15 + 6 + 18 = 47.



Find the highest possible score. Find the lowest possible score.

Try joining five numbers. Now try joining five numbers using only diagonal joins.

Teaching objectives

Solve mathematical problems or puzzles. Add and subtract two-digit numbers mentally.



#### Money bags

Ram divided 15 pennies among four small bags.

He could then pay any sum of money from 1p to 15p, without opening any bag.

How many pennies did Ram put in each bag?





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72

Teaching objectives

Solve mathematical problems or puzzles. Explain methods and reasoning.

Explain methods and reasoning.





## **Presents** Gurmit paid £21 for five presents. For A and B he paid a total of £6. For B and C he paid a total of $\pm 10$ . For C and D he paid a total of $\pm 7$ . For D and E he paid a total of $\pounds 9$ . How much did Gurmit pay for each present? Teaching objectives 57 Solve a given problem by organising information. Explain methods and reasoning. © Crown copyright 2000





#### Four by four

You need some squared paper.

This 4 by 4 grid is divided into two identical parts. Each part has the same area and the same shape.



Find five more ways of dividing the grid into two identical parts by drawing along the lines of the grid. Rotations and reflections do not count as different!

Explore ways of dividing a 4 by 4 grid into two parts with equal areas but different shapes.

## 59

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76

Teaching objectives

Solve mathematical problems or puzzles. Visualise 2-D shapes. Find fractions of shapes.

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## Make five numbers

Take ten cards numbered 0 to 9.



Each time use all ten cards.

Arrange the cards to make:

- a. five numbers that are multiples of 3
- b. five numbers that are multiples of 7
- c. five prime numbers

Make up more problems to use all ten cards to make five special numbers.

## 61

Teaching objectives

Solve mathematical problems or puzzles. Know 3 and 7 times tables. Recognise prime numbers.

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#### Maze

Start with zero.

Find a route from 'Start' to 'End' that totals 100 exactly.



Which route has the highest total? Which has the lowest total?

Now try some different starting numbers.

#### **Teaching objectives**

Solve mathematical problems or puzzles. Add and subtract two-digit numbers mentally. Multiply and divide by single-digit numbers.



79

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Jack's book The pages of Jack's book are numbered from 1. The page numbers have a total of 555 digits. How many pages has the book? How many of the digits are a 5? Teaching objectives 63 Solve mathematical problems or puzzles. Know what each digit represents.





## Age old problems 1. My age this year is a multiple of 8. Next year it will be a multiple of 7. How old am I? 2. Last year my age was a square number. Next year it will be a cube number. How old am I? How long must I wait until my age is both a square number and a cube? 3. My Mum was 27 when I was born. 8 years ago she was twice as old as I shall be in 5 years' time. How old am I now?



Teaching objectives

Solve mathematical problems or puzzles. Know multiplication facts to 10 × 10. Recognise square and cube numbers.

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## Eggs

Mrs Choy spent exactly £10 on 100 eggs for her shop.



## 73

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**Teaching objectives** Solve problems involving ratio and proportion.

Explain methods and reasoning.









## All square

On each of these grids, the counters lie at the four corners of a square.



		$\bigcirc$	
$\bigcirc$			
			$\bigcirc$
	$\bigcirc$		

What is the greatest number of counters you can place on this grid without four of them lying at the corners of a square?





Teaching objectives

Solve a problem by organising information. Visualise 2-D shapes.











**Teaching objectives** 

Solve mathematical problems or puzzles. Estimate lengths and convert units of capacity. Develop calculator skills and use a calculator effectively.



Millennium At what time of what day of what year will it be: a. 2000 seconds b. 2000 minutes c. 2000 hours d. 2000 days e. 2000 weeks after the start of the year 2000?



Teaching objectives

Solve mathematical problems or puzzles. Convert smaller to larger units of time. Develop calculator skills and use a calculator effectively.

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#### 5 6 7 8 9 3 Choose four of these digits. Each one must be different. Put one digit in each box. This makes two 2-digit numbers reading across and two 2-digit numbers reading down. Add up all four of the numbers. In this example the total is 100. 2 1 12 + 47 + 14 + 27 = 100 4 7 How many different ways of making 200 can you Teaching objectives Solve mathematical problems or puzzles. Know what each digit represents. Add several two-digit numbers.

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