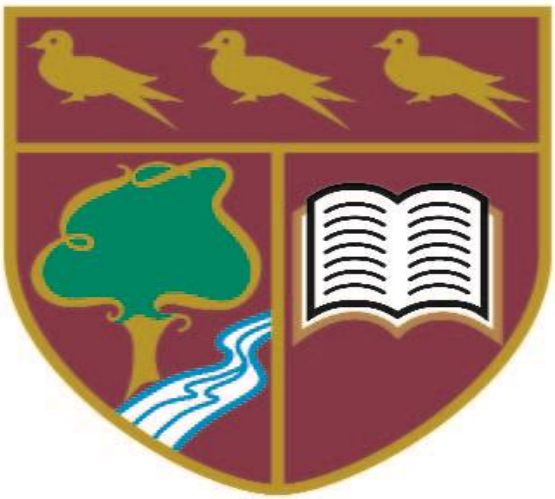
Lower School
Written Methods
A Parent Booklet



Pound Hill Junior School

The maths work your child is doing at school may look different to the kind of calculations you remember. This is because children are encouraged to work mentally, where possible, using personal jottings to help support their thinking. Even when children are taught more formal written methods, they are only encouraged to use these methods for calculations they cannot solve in their heads.

When faced with a calculation problem, encourage your child to ask…

- Could I do this in my head using drawings or jottings to help me?
- Do I need to use a written method?

However, when the time comes, the written methods for the four operations of addition, subtraction, multiplication, and division that we teach the children have not fundamentally changed. It is more the finer details, such as what we call the 'exchanging' process or where we record a carry that there seems to be a difference between the way people have learnt and how children are taught at PHJS.

Some parents also worry that they will confuse children by teaching them a different method. However, if there is a discussion comparing the benefits and drawbacks of each method, this can be a valuable learning tool on the path to Mastery. Discussing the efficiency and suitability of different strategies is an important part of maths lessons.

In this booklet we will show you the different methods your child will use as they progress through the school. If you support the children master these methods at home, it will provide a stable foundation for further learning.

Success Ladders will also be provided to emulate the learning process that we use in the classroom, as well as some activities designed to broaden and deepen the children's learning. Key Language for each method will be provided like this: *Language*

If you would like further resources and worksheets, go to https://whiterosemaths.com/parent-resources and go to the appropriate resource page.

The following methods will be covered in this booklet:

The following methods will be covered in this booklet: **<u>Addition & Subtraction</u>** • Expanded & Compact Method up to 4 digits **<u>Multiplication</u>** • Grid Method up to HTO x O • Short Multiplication up to ThHTO x O	Next to each success ladder, there will be a QR code. Use the ipads or your phone to scan the code using the photo app, which will take you to a video of Mr Ferguson talking through the method. The code below will take you to the website which has all the videos together. **Please note that the QR links take you to a youtube video. This was the easiest way to upload these videos, but there is no controlling the recommended videos or ads. Please be aware and monitor any children viewing these videos as you normally would with online safety.**

AO: Use the expanded written method for addition

Greater Depth
Solve addition problems
Met
Use the expanded method to solve addition calculations
Working Towards
Use the expanded method to solve addition calculations with support with laying out

Addition methods video

KEY LANGUAGE: *Partition* *Carry* *Bridging*

WT- Solve the calculations. Remember to start adding the ones column first.

Without Carries

1) 425 + 372 =

Partition

	4	0	0		2	0		5
+	3	0	0		7	0		2

2) 274 + 513 =

	2	0	0		7	0		4
+	5	0	0		1	0		3

With Carries

3) 483 + 164 =

	4	0	0		8	0		3
+	1	0	0		6	0		4

Carry when *bridging* into the next column

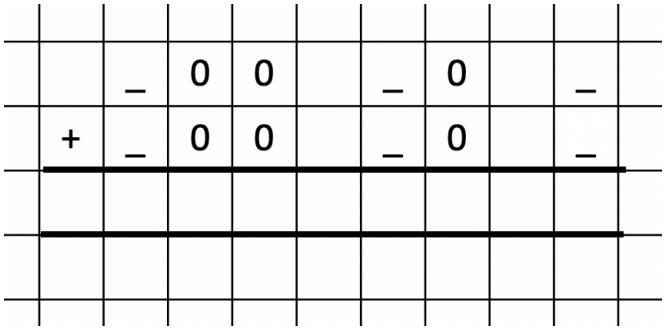
4) 748 + 423 =

	7	0	0		4	0		8
+	4	0	0		2	0		3

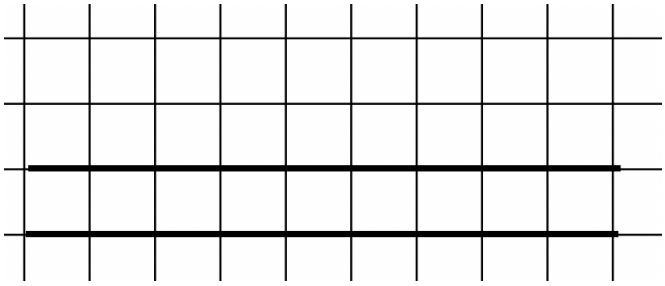
Met- Lay out and solve the calculations

Without Carries

1) 724 + 173 =

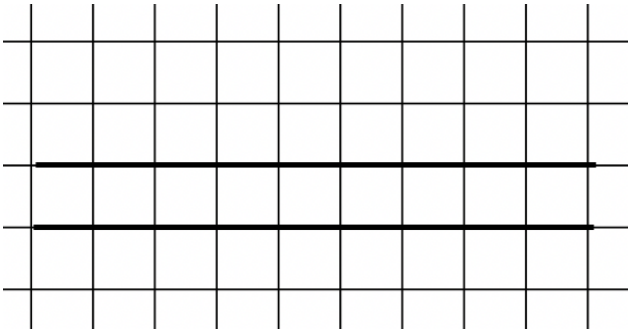


2) 413 + 365 =

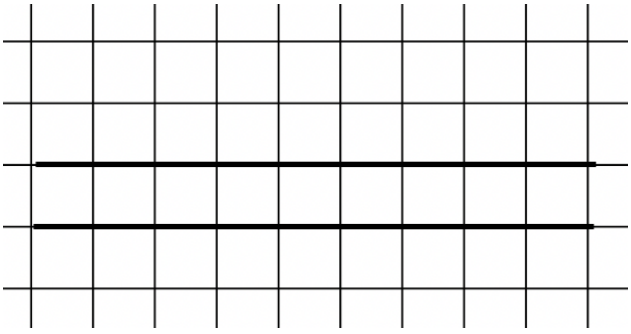


With Carries

3) 371 + 576 =

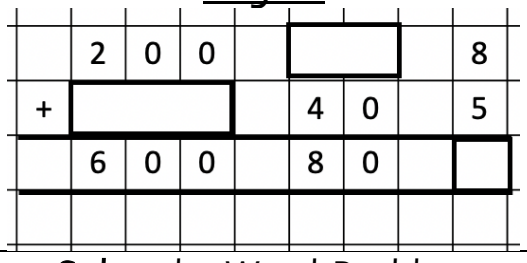


4) 438 + 159 =

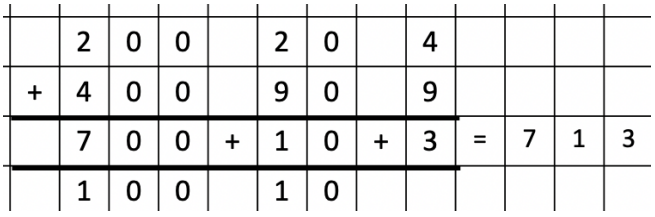


Greater Depth – Solve the problems on the square paper below

Reasoning: find the missing digits



Explain the mistake



Solve the Word Problem

Year 3 earn £263 at the book sale and Year 4 earn £318. How much do they earn altogether?

What if: Adapt one of these problems for a partner.

- Can you change the **context** of the word problem?
- Can you choose appropriate digits for the other problems?

Answers- check answers with a green pen

WT	Met
1) 425 + 372 = 797	1) 724 + 173 = 897
2) 274 + 513 = 787	2) 413 + 365 = 778
3) 483 + 164 = 647	3) 371 + 576 = 947
4) 748 + 423 = 1,171	4) 438 + 159 = 597

	2	0	0		3	0		8
	4	0	0		4	0		5
	6	0	0		8	0		3
					1	0		

GD Word Problem - £263 + £318 = £581

Explain – Forgotten to add the carry in the tens, should be 723

AO: Use the compact written method for addition

Greater Depth
Solve addition problems
Met
Use the compact method to solve addition and subtraction calculations
Working Towards
Use the compact method to solve addition and subtraction calculations with support with laying out
KEY LANGUAGE: *Carry* *Bridging*

Expanded & Compact video

Compact addition

WT- Solve the calculations. Remember to start adding the ones column first.

Without Carries

1) 523 + 346 =

	5	2	3
+	3	4	6

2) 2,374 + 1,623 =

	2	3	7	4
+	1	6	2	3

With Carries

3) 635 + 347 =

	6	3	5
+	3	4	7

Carry when *bridging* into the next column

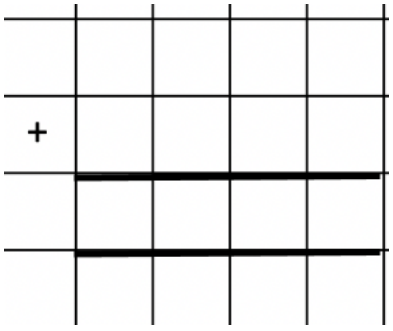
4) 2,739 + 3,416 =

	2	7	3	9
+	3	4	1	6

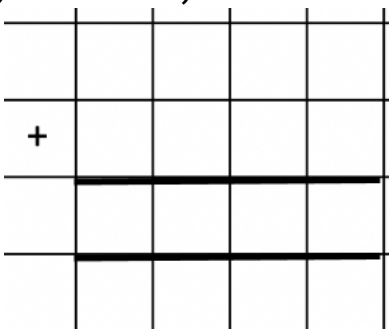
Met- Lay out and solve the calculations

Without Carries

1) 327 + 641 =

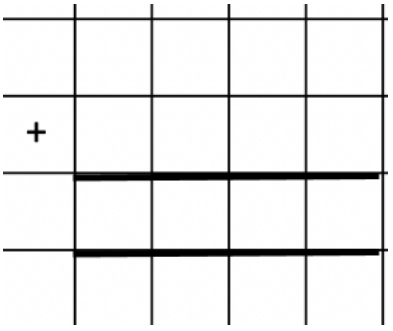


2) 3,273 + 5,426 =

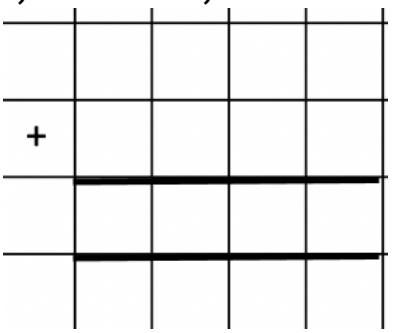


With Carries

3) 392 + 546 =



4) 3,482 + 4,856 =



GD – Solve the problems on the square paper below

Reasoning: *find the missing digits*

	3		8	
+		4		1
	7	9	3	8

Explain *the mistake*

	1	7	9	3
+	6	3	5	6
	8	0	4	9
	1			

Solve *the Word Problem*

4,285 people attend a football match on one day. 3,629 attend the next day. How many people attend altogether?

What if: Adapt *one of these problems for a partner.*

- *Can you change the* **context** *of the word problem?*
- *Can you choose appropriate digits for the other problems?*

Answers- check answers with a green pen

WT	Met
1) 523 + 346 = 869	5) 327 + 641 = 968
2) 2,374 + 1,623 = 3997	6) 3,273 + 5,426 = 8699
3) 635 + 347 = 982	7) 392 + 546 = 938
4) 2,739 + 3,416 = 6155	8) 3,482 + 4,856 = 8338

	3	4	8	7
+	4	4	5	1
	7	9	3	8
		1		

GD Word Problem - 4,285 + 3,629 = 7,914

Explain – Forgotten to add the carry in the hundreds, should be 8149

AO: Use a written method for subtraction

Greater Depth	Subtraction methods video
Solve subtraction problems	
Met	
Choose the expanded or compact method to solve subtraction calculations **with exchanging**	Compact subtraction
Working Towards	
Choose the expanded or compact method to solve subtraction calculations **without exchanging**	
KEY LANGUAGE: *Partition* *Exchange*	

WT- Solve the calculations. Remember to start subtracting the ones column first.

Expanded Method

1) 867 - 322 =

Partition

	8	0	0		6	0		7
-	3	0	0		2	0		2

2) 935 - 324 =

Which method do you prefer?

Compact Method

1) 867 - 322 =

		8	6	7
-		3	2	2

2) 935 - 324 =

-				

Met- Solve the calculations. Remember to go to the column to left and *exchange* if you don't have enough ones, tens or hundreds

Expanded Method

1) 952 – 427 =

Do you have enough ones for 2 – 7?
Exchange from the tens column

	9	0	0		5	0	2
-	4	0	0		2	0	7

2) 734 – 192 =

Compact Method

1) 952 - 427 =

Do you have enough ones for 2 – 7?
Exchange from the tens column

	9	5	2
-	4	2	7

2) 734 – 192 =

-				

Greater Depth – Solve the problems on the square paper below

Reasoning: find the missing digits

	5		2	
-		4		1
	1	2	8	3

Explain the mistake

	$^{6}\not{7}$	$^{1}2$	5	3
-	6	3	4	6
		9	1	3

Solve the Word Problem

Year 3 earn £483 at the book sale and Year 4 earn £839. How much more do Year 4 earn?

What if: Adapt one of these problems for a partner.

- Can you change the **context** of the word problem?
- Can you choose appropriate digits for the other problems?

Answers- check answers with a green pen

WT	Met
1) 867 - 322 = 545 2) 935 - 324 = 611	1) 952 – 427 = 525 2) 734 – 192 = 542

	5	7	2	4
-	4	4	4	1
	1	2	8	3

GD Word Problem - £839 - £483 = £356

Explain – Found the difference in the ones column, forgot to exchange. Should be 907

AO: Use the grid method for multiplication

Greater Depth
Solve multiplication problems
Met
Use the grid method for multiplication
Working Towards
Use the grid method for multiplication with support with laying out

Grid & short method video

KEY LANGUAGE: *Partition* *Multiply* *Add*

WT- Partition, solve each part and then add up the amounts in each box.

2 digit x 1 digit

1) 45 x 8 =

X	40	5
8		

If I know 8 x 4 = 32, then I know 8 x 40 =

2) 23 x 6 =

X	20	3
6		

3) 79 x 4 =

X	70	9
4		

3 digit x 1 digit

4) 463 x 2 =

X	400	60	3
2			

If I know 2 x 4 = 8, then I know 2 x 400 =

5) 624 x 8 =

X	600	20	4
8			

6) 847 x 3 =

X	800	40	7
3			

Met- Partition, solve each part and then add up the amounts in each box.

2 digit x 1 digit

1) 63 x 4 =

X	_0	_
_		

If I know 6 x 4 = 24, then I know 60 x 4 =

2) 49 x 6 =

X		

3) _ _ x _ =

Think of your own **different** digits

X		

3 digit x 1 digit

4) 839 x 4 =

X	_00	_0	
_			

If I know 8 x 4 = 32, then I know 8 x 400 =

5) 593 x 7 =

X			

6) _ _ _ x _ =

Think of your own **different** digits

X			

GD – Solve the problems on the square paper below

Reasoning: find the missing digits

?? x 6 = 504

X	__	_
6	480	_

Explain the mistake

376 x 8 = 848

X	300	70	6
8	240	560	48

Solve the Word Problem

A roman army marches 147 miles in a week. How far could they march in 4 weeks?

What if: Adapt one of these problems for a partner.

- Can you change the **context** of the word problem?
- Can you choose appropriate digits for the other problems?

Answers- check answers with a green pen

WT	Met
1) 45 x 8 = 360	1) 63 x 4 = 252
2) 23 x 6 = 138	2) 49 x 6 = 294
3) 79 x 4 = 316	3) Calculator
4) 463 x 2 = 926	4) 839 x 4 = 3,356
5) 624 x 8 = 4,992	5) 593 x 7 = 4,151
6) 847 x 3 = 2,541	6) Calculator

MISSING DIGITS

84 x 6 = 504

X	80	4
6	480	24

GD Word Problem – 147 x 4 = 588 miles

Explain – 8 x 300 = 2400 not 240 – should be ten times bigger so 376 x 8 = 3,008

AO: Use the short multiplication method

Greater Depth
Solve multiplication problems
Met
Use the short multiplication method with awkward digits
Working Towards
Use the short multiplication method with simple digits
KEY LANGUAGE: *Carry*

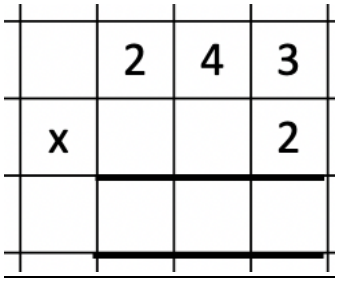
Grid & short method video

Short method

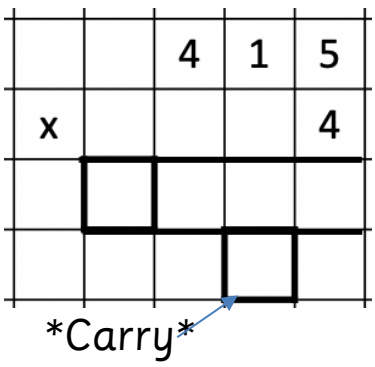
WT- Solve the calculations. Remember to start multiplying the ones column first.

3 x 1 digit

1) 243 x 2 =

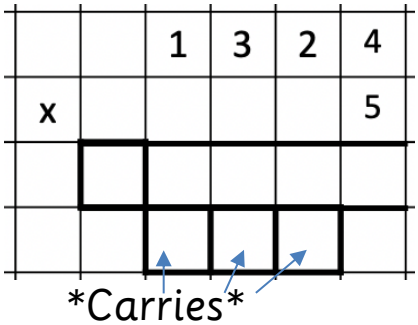


2) 415 x 4 =

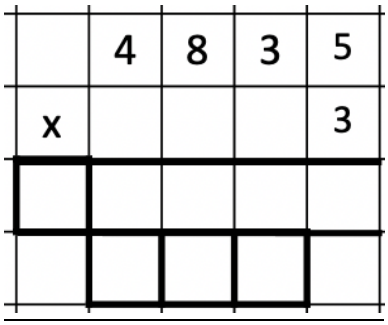


4 x 1 digit

3) 1,324 x 5 =



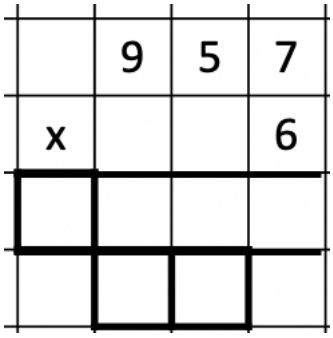
4) 4,835 x 3 =



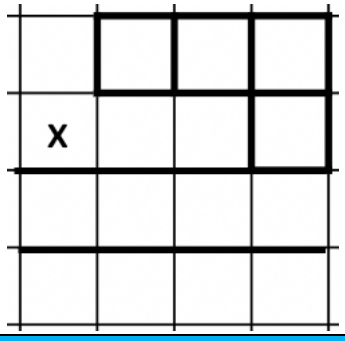
Met- Solve the calculations. Remember to start multiplying the ones column first.

3 x 1 digit

1) 957 x 6 =

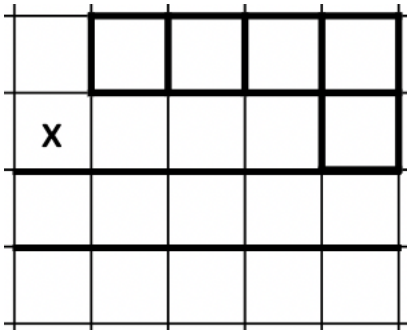


2) 639 x 8=

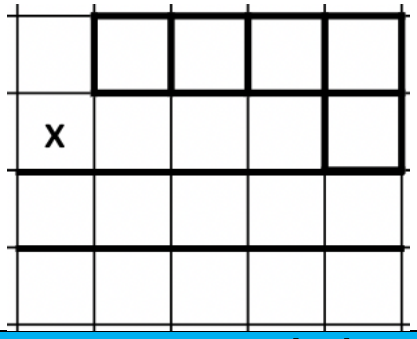


4 x 1 digit

3) 4,876 x 9 =

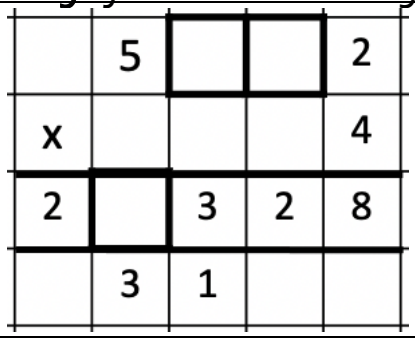


4) 9,386 x 7 =

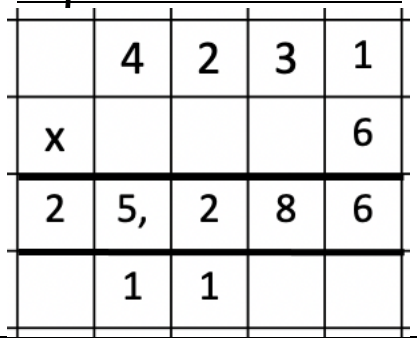


GD – Solve the problems on the square paper below

Reasoning: *find the missing digits*



Explain *the mistake*



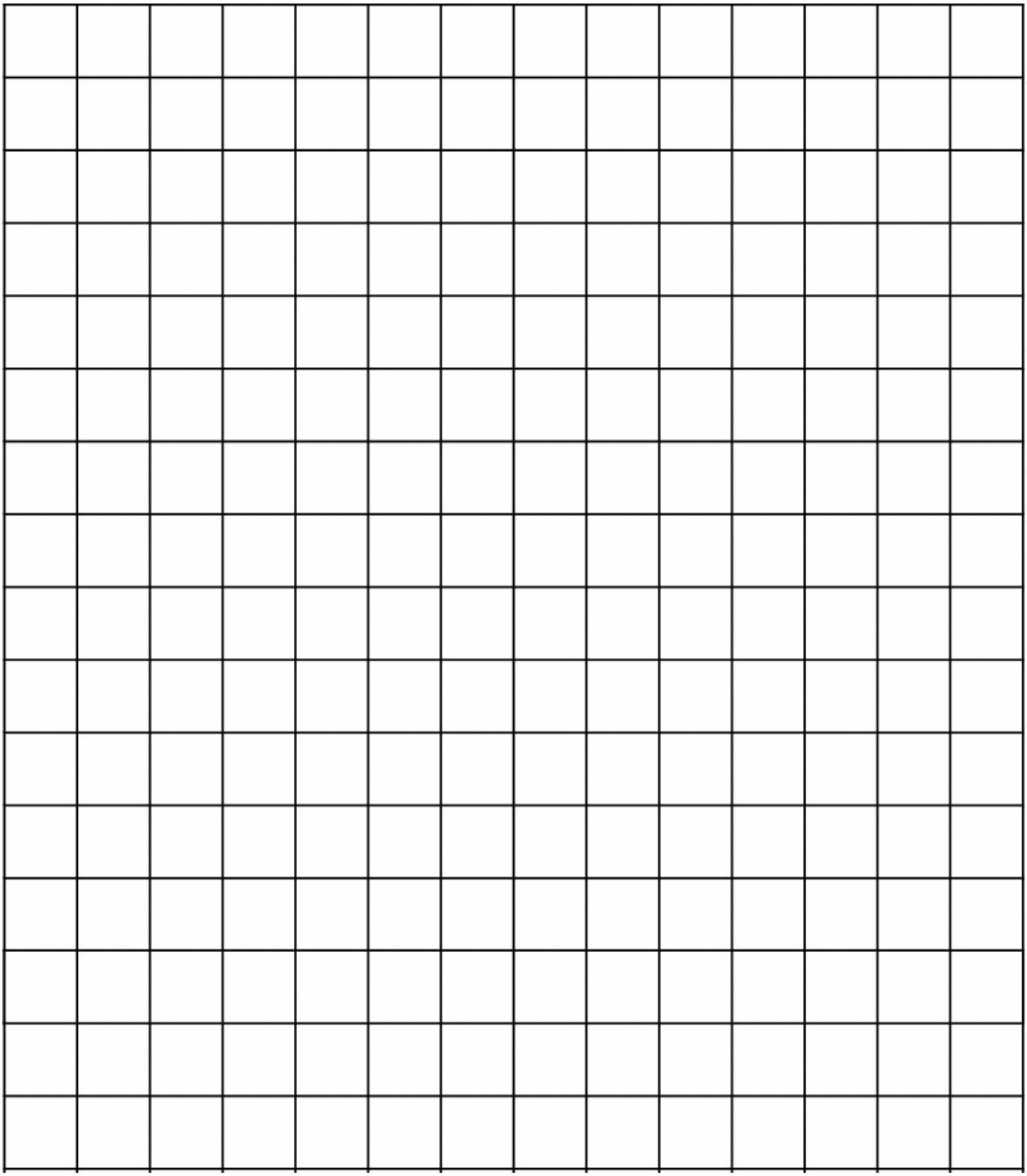
Solve *the Word Problem*

Each school chair weighs 2,154 grams. How much does 6 weigh?

Can you give your answer in grams and Kilograms?

What if: Adapt *one of these problems for a partner.*

- *Can you change the* ***context*** *of the word problem?*
- *Can you choose appropriate digits for the other problems?*



Answers- check answers with a green pen

WT	Met
1) 243 x 2 = 486	5) 957 x 6 = 5,742
2) 415 x 4 = 1,660	6) 639 x 8 = 5,112
3) 1324 x 5 = 6,620	7) 4,876 x 9 = 43,884
4) 4835 x 3 = 14,505	8) 9,386 x 7 = 65,702

MISSING DIGITS

	5	8	3	2
x				4
2	3	3	2	8
	3	1		

GD Word Problem – 2154 x 6 = 12,924g = 12.924kg

Explain – Forgotten to add the carry in the hundreds, should be 25,386