Year 5 - Column Addition — Lesson Guide

Step 1

18,526 + 11,495 = ☐

First, we circle the plus sign so we know to add the two parts and find their sum.

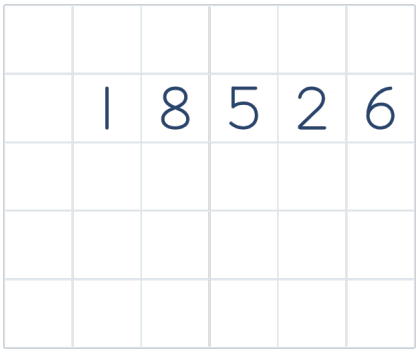
Step 2

18,526 + 11,495 = ☐

First, check whether a mental method would be quicker. Look at the ones. 6 ones and 5 ones make 11 ones. We can exchange 10 ones for 1 ten. Column addition keeps the place values lined up.

Step 3

18,526 + 11,495 = ☐



The first digit of 18,526, 1, is in the ten thousands column, so we start there. Now, we write 18,526 in the correct columns, with one digit in each box.

Step 4

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5

Remember: There must always be a digit in the ones column, even if it is a 0.

Then, we write a plus sign on the left of the calculation. 11,495 has five digits, so we start with 1 in the ten thousands column. We write 11,495 in the correct columns, with one digit in each box.

Step 5

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5

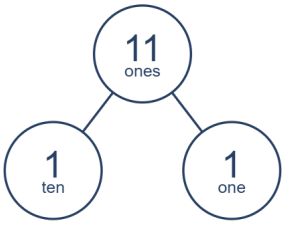
Draw a line under 11,495. Leave one row for the sum, then draw the second line below that row. Write exchanges below the second line.

Step 6

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5

First, we add the ones, the smallest place-value column. 6 ones + 5 ones = 11 ones. As we can only write one digit per box, we partition 11 ones into 1 ten and 1 one.



Step 7

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5
					1
				1	

We write the 1 ten in the tens column underneath the answer, ready for the next step. Then we write the remaining 1 one in the ones answer box.

Step 8

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5
					1
				1	

Remember: Check both places. Keep the small 1 below the tens column and the 1 in the ones answer square.

The small 1 below the tens column stands for 1 ten. The 1 in the ones answer square stands for 1 one. Together, they make 11 ones.

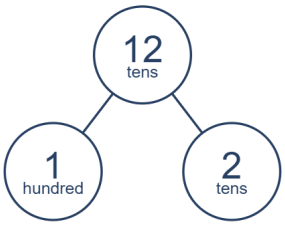
Step 9

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5
					1
				1	

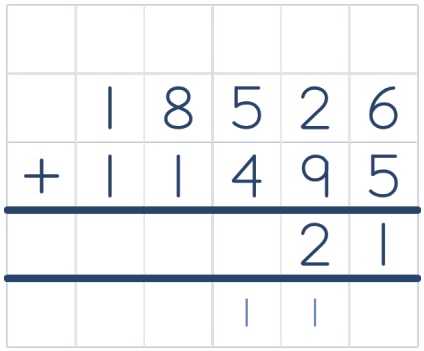
Remember: Look below the column you are working on. Add the exchanged amount written there.

Next, we add the tens. 2 tens + 9 tens = 11 tens. Add the 1 exchanged ten shown by the small 1 below the tens column. 11 tens + 1 exchanged ten = 12 tens. As we can only write one digit per box, we partition 12 tens into 1 hundred and 2 tens.



Step 10

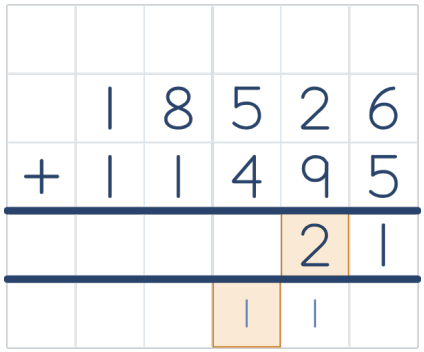
18,526 + 11,495 = ☐



We write the 1 hundred in the hundreds column underneath the answer, ready for the next step. Then we write the remaining 2 tens in the tens answer box.

Step 11

18,526 + 11,495 = ☐



Remember: Check both places. Keep the small 1 below the hundreds column and the 2 in the tens answer square.

The small 1 below the hundreds column stands for 1 hundred. The 2 in the tens answer square stands for 2 tens. Together, they make 12 tens.

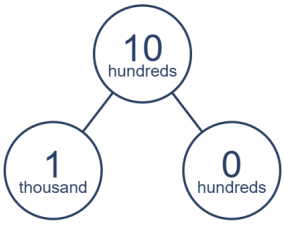
Step 12

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5
				2	1
			1	1	

Remember: Look below the column you are working on. Add the exchanged amount written there.

Next, we add the hundreds. 5 hundreds + 4 hundreds = 9 hundreds. Add the 1 exchanged hundred shown by the small 1 below the hundreds column. 9 hundreds + 1 exchanged hundred = 10 hundreds. As we can only write one digit per box, we partition 10 hundreds into 1 thousand and 0 hundreds.



Step 13

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5
			0	2	1
		1	1	1	

We write the 1 thousand in the thousands column underneath the answer, ready for the next step. Then we write the remaining 0 hundreds in the hundreds answer box.

Step 14

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5
			0	2	1
		1			

Remember: Check both places. Keep the small 1 below the thousands column and the 0 in the hundreds answer square.

The small 1 below the thousands column stands for 1 thousand. The 0 in the hundreds answer square stands for 0 hundreds. Together, they make 10 hundreds.

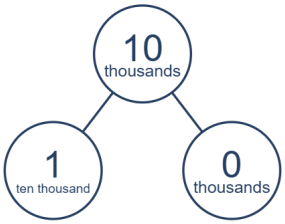
Step 15

18,526 + 11,495 = ☐

	1	8	5	2	6
+	1	1	4	9	5
			0	2	1
		1			

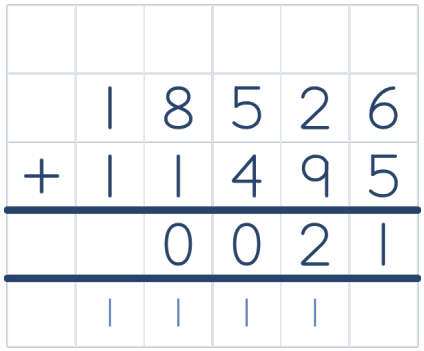
Remember: Look below the column you are working on. Add the exchanged amount written there.

After that, we add the thousands. 8 thousands + 1 thousand = 9 thousands. Add the 1 exchanged thousand shown by the small 1 below the thousands column. 9 thousands + 1 exchanged thousand = 10 thousands. As we can only write one digit per box, we partition 10 thousands into 1 ten thousand and 0 thousands.



Step 16

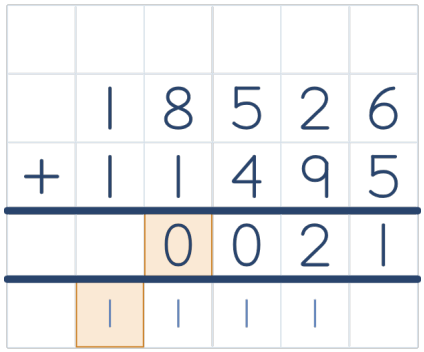
18,526 + 11,495 = ☐



We write the 1 ten thousand in the ten thousands column underneath the answer, ready for the next step. Then we write the remaining 0 thousands in the thousands answer box.

Step 17

18,526 + 11,495 = ☐

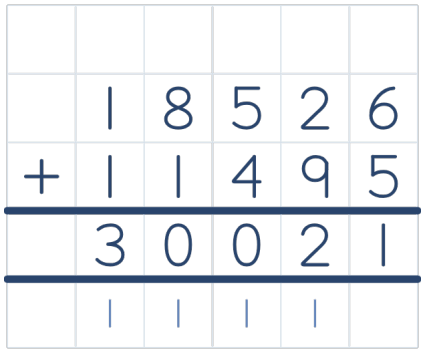


Remember: Check both places. Keep the small 1 below the ten thousands column and the 0 in the thousands answer square.

The small 1 below the ten thousands column stands for 1 ten thousand. The 0 in the thousands answer square stands for 0 thousands. Together, they make 10 thousands.

Step 18

18,526 + 11,495 = ☐

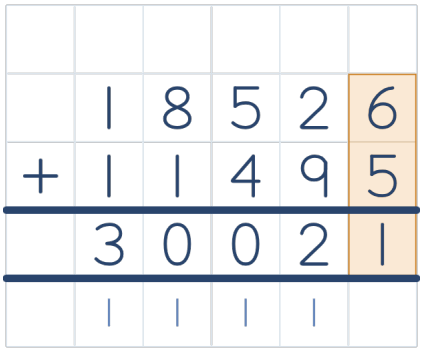


Remember: Look below the column you are working on. Add the exchanged amount written there.

Finally, we add the ten thousands. 1 ten thousand + 1 ten thousand = 2 ten thousands. Add the 1 exchanged ten thousand shown by the small 1 below the ten thousands column. 2 ten thousands + 1 exchanged ten thousand = 3 ten thousands. We write 3 in the ten thousands column. No exchange is needed this time.

Step 19

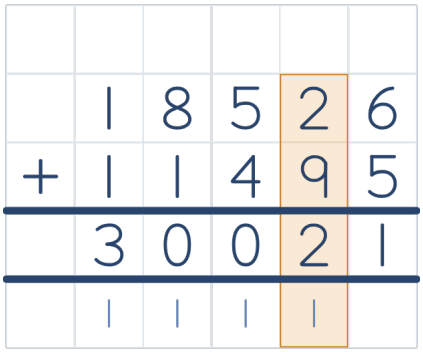
18,526 + 11,495 = ☐



Our sum is 30,021. Before we copy our answer into the answer box, let's check each column, including the exchanges. First, we check the ones: 6 + 5 = 11. We have correctly recorded 1 ten underneath the answer and 1 one in the ones answer box.

Step 20

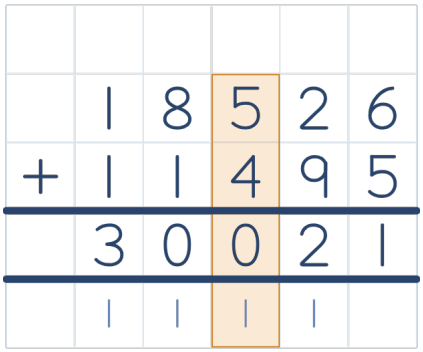
18,526 + 11,495 = ☐



Next, we check the tens, including the exchanged ten: 2 + 9 + 1 = 12. We have correctly recorded 1 hundred underneath the answer and 2 tens in the tens answer box.

Step 21

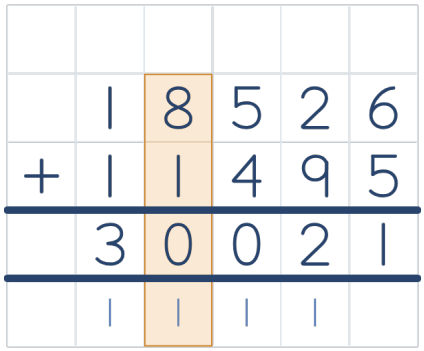
18,526 + 11,495 = ☐



Then, we check the hundreds, including the exchanged hundred: 5 + 4 + 1 = 10. We have correctly recorded 1 thousand underneath the answer and 0 hundreds in the hundreds answer box.

Step 22

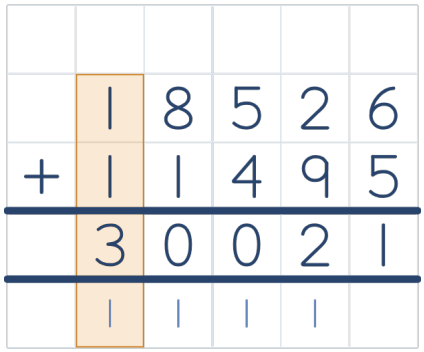
18,526 + 11,495 = ☐



After that, we check the thousands, including the exchanged thousand: 8 + 1 + 1 = 10. We have correctly recorded 1 ten thousand underneath the answer and 0 thousands in the thousands answer box.

Step 23

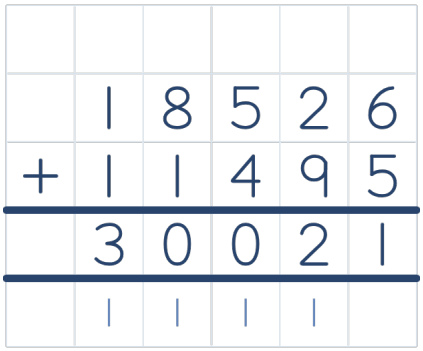
18,526 + 11,495 = ☐



Finally, we check the ten thousands, including the exchanged ten thousand: 1 + 1 + 1 = 3. We have correctly included the exchanged ten thousand and written 3 in the ten thousands answer box.

Step 24

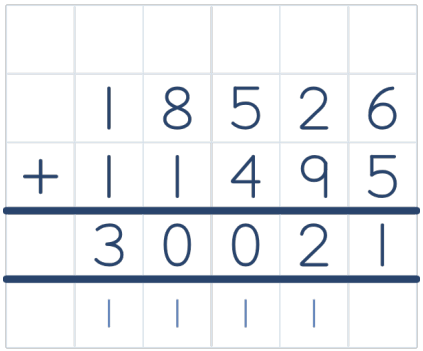
18,526 + 11,495 = **30021**



The sum is 30021. Copy 30021 into the answer box. Make sure you copy the answer correctly.

Step 25

18,526 + 11,495 = **30021**



We can round to check whether our sum makes sense. Round 18,526 to 19,000 and 11,495 to 11,000, both to the nearest thousand. 19,000 + 11,000 = 30,000. Each number changes by at most 500. Our exact answer, 30,021, is within 1,000 of the estimate.

Year 5 - Column Subtraction — Lesson Guide

Step 1

58,126 – 19,579 = ☐

First, we circle the minus sign so we know to subtract and find the difference.

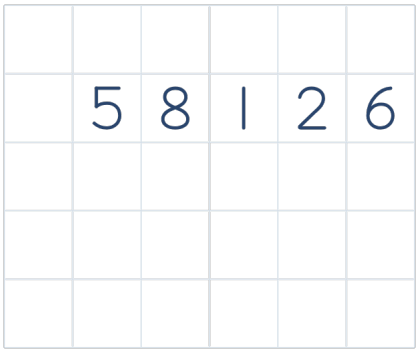
Step 2

58,126 – 19,579 = ☐

First, check whether a mental method would be quicker. Look at the ones. We have 6 ones and need to subtract 9 ones. Column subtraction helps us record the exchange.

Step 3

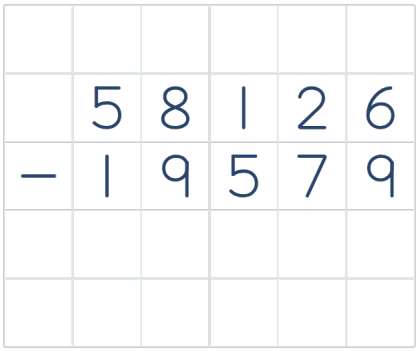
58,126 – 19,579 = ☐



The first digit of 58,126, 5, is in the ten thousands column, so we start there. Now, we write 58,126 in the correct columns, with one digit in each box.

Step 4

58,126 – 19,579 = ☐

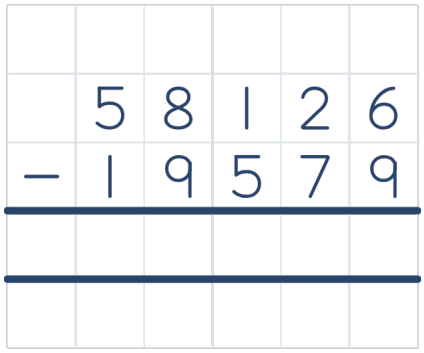


Remember: There must always be a digit in the ones column, even if it is a 0.

Then, we write a minus sign on the left of the calculation. The first digit of 19,579, 1, is in the ten thousands column, so we start there. We write 19,579 in the correct columns, with one digit in each box.

Step 5

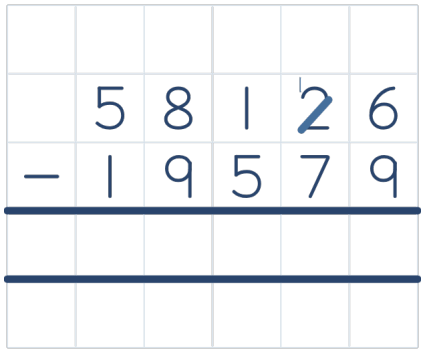
58,126 – 19,579 = ☐



Draw a line under 19,579. Leave one row for the difference, then draw the second line below that row.

Step 6

58,126 – 19,579 = ☐



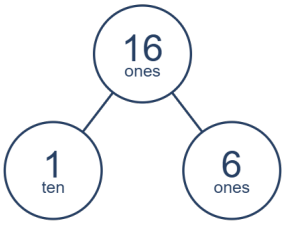
We have 6 ones and need to subtract 9 ones. Exchange 1 ten from the 2 tens for 10 ones. Cross out the 2 and write a small 1 at the top left of the tens square. We now have 1 ten in that column.

Step 7

58,126 – 19,579 = ☐

	5	8	1	2	6
–	1	9	5	7	9

Write a small 1 at the top left of the ones square, beside the 6 already there. The small 1 stands for 10 more ones. Read the two digits together as 16 ones. Keep the original 6 in its place.



Step 8

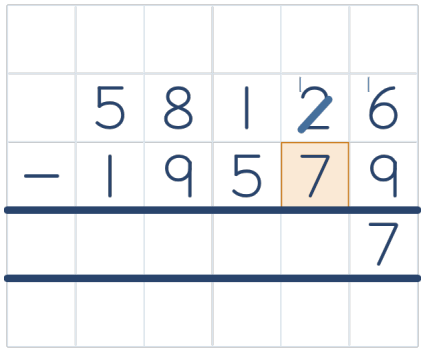
58,126 – 19,579 = ☐

	5	8	1	2	6
–	1	9	5	7	9
					7

16 ones – 9 ones = 7 ones, so we write 7 in the ones column.

Step 9

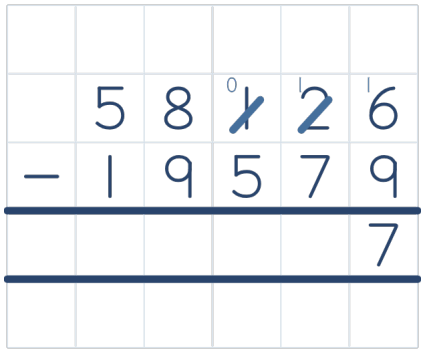
58,126 – 19,579 = ☐



The earlier exchange left 1 ten, so we use that current value instead of the crossed-out 2.

Step 10

58,126 – 19,579 = ☐



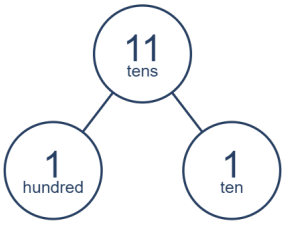
We have 1 ten and need to subtract 7 tens. Exchange 1 hundred from the 1 hundred for 10 tens. Cross out the 1 and write a small 0 at the top left of the hundreds square. We now have 0 hundreds in that column.

Step 11

58,126 – 19,579 = ☐

	5	8	0 ~~1~~	11 ~~2~~	6
–	1	9	5	7	9
					7

Write a small 1 at the top left of the tens square, beside the 1 already there. The small 1 stands for 10 more tens. Read the two digits together as 11 tens. Keep the original 1 in its place.



Step 12

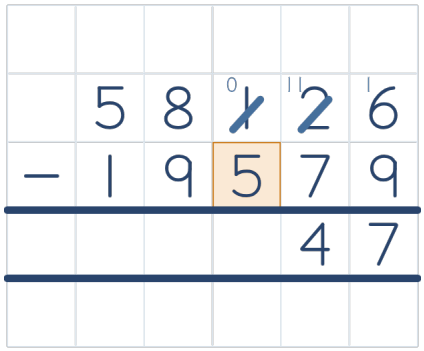
58,126 – 19,579 = ☐

	5	8	0 ~~1~~	11 ~~2~~	6
–	1	9	5	7	9
				4	7

11 tens – 7 tens = 4 tens, so we write 4 in the tens column.

Step 13

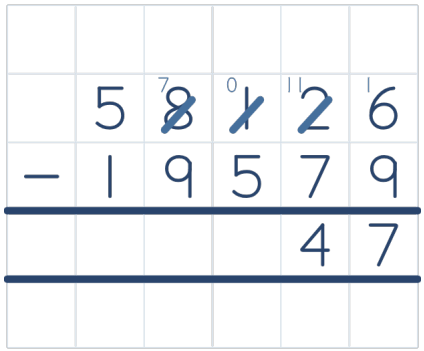
58,126 – 19,579 = ☐



The earlier exchange left 0 hundreds, so we use that current value instead of the crossed-out 1.

Step 14

58,126 – 19,579 = ☐



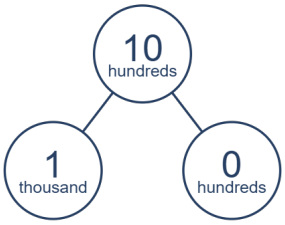
We have 0 hundreds and need to subtract 5 hundreds. Exchange 1 thousand from the 8 thousands for 10 hundreds. Cross out the 8 and write a small 7 at the top left of the thousands square. We now have 7 thousands in that column.

Step 15

58,126 – 19,579 = ☐

	5	7 ~~8~~	10 ~~1~~	11 ~~2~~	6
–	1	9	5	7	9
				4	7

Write a small 1 at the top left of the hundreds square, beside the 0 already there. The small 1 stands for 10 more hundreds. Read the two digits together as 10 hundreds. Keep the original 0 in its place.



Step 16

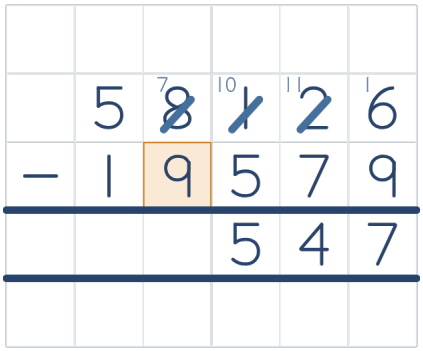
58,126 – 19,579 = ☐

	5	7 ~~8~~	10 ~~1~~	11 ~~2~~	6
–	1	9	5	7	9
			5	4	7

10 hundreds – 5 hundreds = 5 hundreds, so we write 5 in the hundreds column.

Step 17

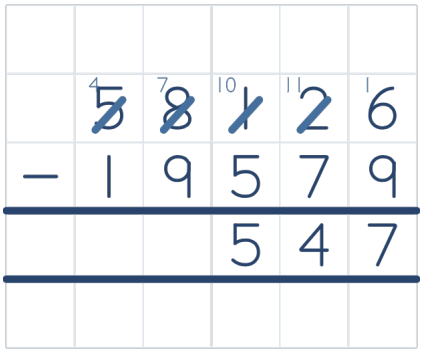
58,126 – 19,579 = ☐



The earlier exchange left 7 thousands, so we use that current value instead of the crossed-out 8.

Step 18

58,126 – 19,579 = ☐



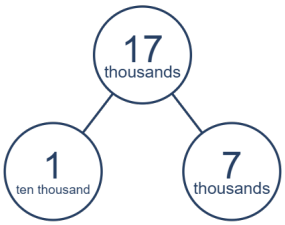
We have 7 thousands and need to subtract 9 thousands. Exchange 1 ten thousand from the 5 ten thousands for 10 thousands. Cross out the 5 and write a small 4 at the top left of the ten thousands square. We now have 4 ten thousands in that column.

Step 19

58,126 – 19,579 = ☐

	4	17	10	11	1
	~~5~~	~~8~~	~~1~~	~~2~~	6
–	1	9	5	7	9
			5	4	7

Write a small 1 at the top left of the thousands square, beside the 7 already there. The small 1 stands for 10 more thousands. Read the two digits together as 17 thousands. Keep the original 7 in its place.



Step 20

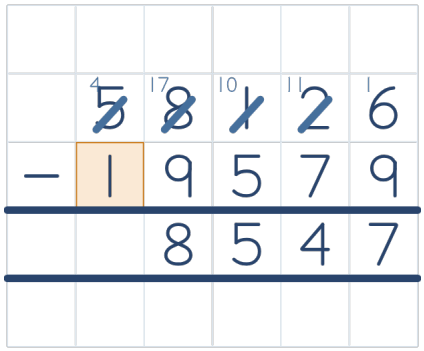
58,126 – 19,579 = ☐

	4	17	10	11	1
	~~5~~	~~8~~	~~1~~	~~2~~	6
–	1	9	5	7	9
		8	5	4	7

17 thousands – 9 thousands = 8 thousands, so we write 8 in the thousands column.

Step 21

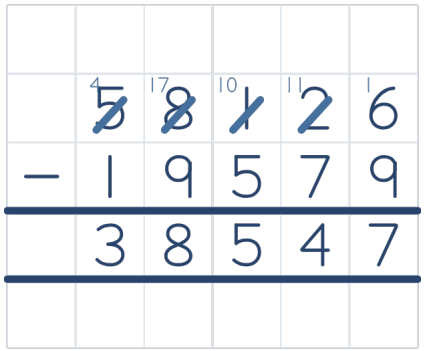
58,126 – 19,579 = ☐



The earlier exchange left 4 ten thousands, so we use that current value instead of the crossed-out 5.

Step 22

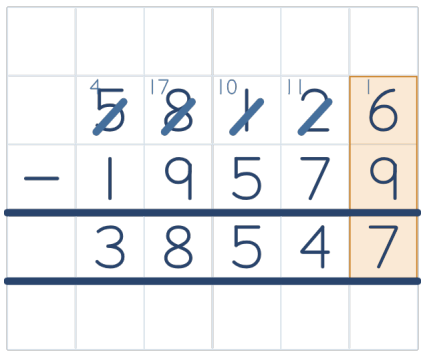
58,126 – 19,579 = ☐



Finally, we subtract the ten thousands, which is 4 ten thousands – 1 ten thousand. 4 ten thousands – 1 ten thousand = 3 ten thousands, so we write 3 in the ten thousands column. No exchange is needed this time.

Step 23

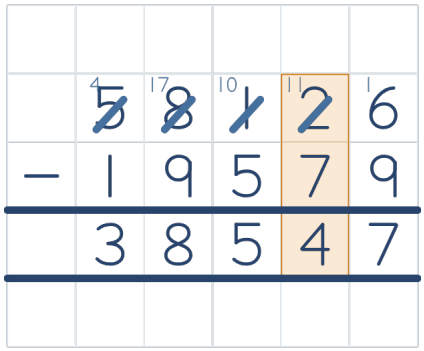
58,126 – 19,579 = ☐



Our difference is 38,547. Before we copy our answer into the answer box, let's check each column, including the exchanges. First, we check the ones: 16 ones – 9 ones = 7 ones. We have correctly written 7 in the ones answer box.

Step 24

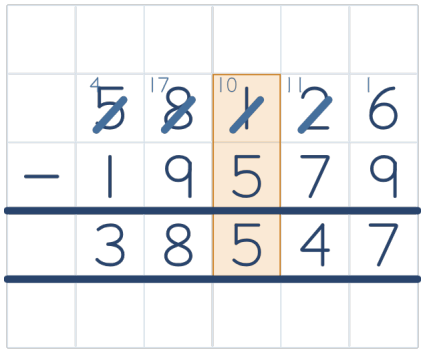
58,126 – 19,579 = ☐



Next, we check the tens: 11 tens – 7 tens = 4 tens. We have correctly written 4 in the tens answer box.

Step 25

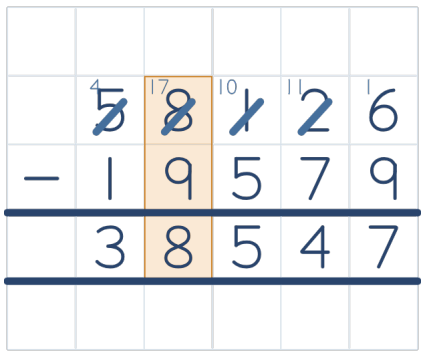
58,126 – 19,579 = ☐



Then, we check the hundreds: 10 hundreds – 5 hundreds = 5 hundreds. We have correctly written 5 in the hundreds answer box.

Step 26

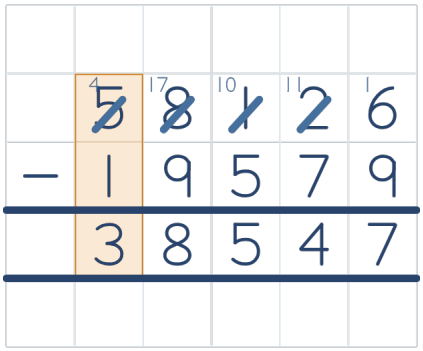
58,126 – 19,579 = ☐



Then, we check the thousands: 17 thousands – 9 thousands = 8 thousands. We have correctly written 8 in the thousands answer box.

Step 27

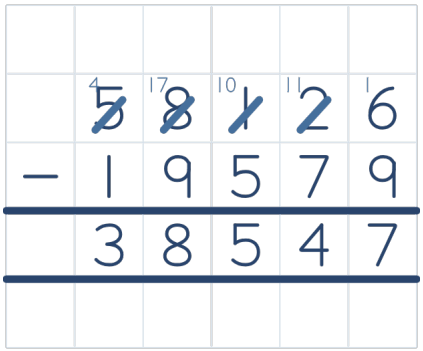
58,126 – 19,579 = ☐



Finally, we check the ten thousands: 4 ten thousands – 1 ten thousand = 3 ten thousands. We have correctly written 3 in the ten thousands answer box.

Step 28

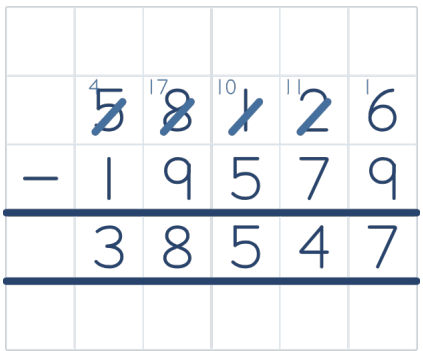
58,126 – 19,579 = **38547**



The difference is 38547. Copy 38547 into the answer box. Make sure you copy the answer correctly.

Step 29

58,126 – 19,579 = **38547**

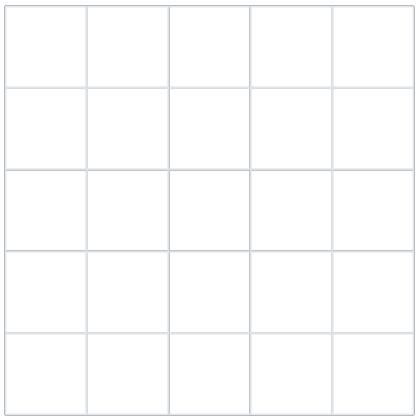


We can round to check whether our difference makes sense. Round 58,126 to 58,000 and 19,579 to 20,000, both to the nearest thousand. 58,000 – 20,000 = 38,000. Each number changes by at most 500. Our exact answer, 38,547, is within 1,000 of the estimate.

Year 5 - Column Multiplication — Lesson Guide

Step 1

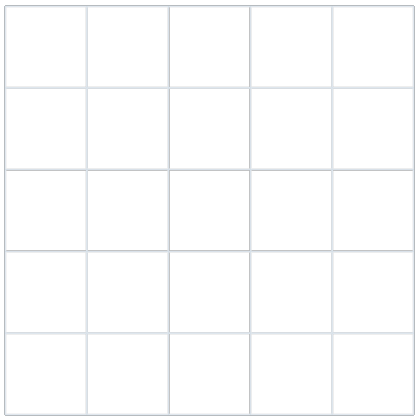
1,142 × 2 = ☐



First, we circle the multiplication sign so we know to multiply the two factors and find their product.

Step 2

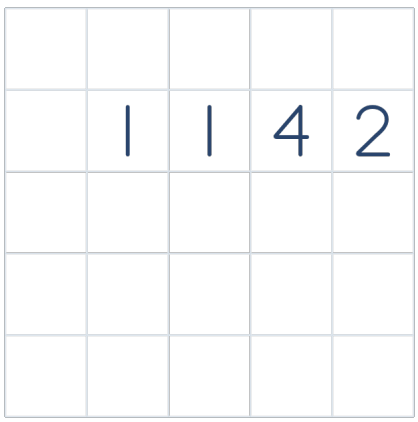
1,142 × 2 = ☐



First, check whether a mental method would be quicker. The factor 2 multiplies each place value in 1,142. Line up the digits to keep each place value in its own column. Start with 2 ones × 2.

Step 3

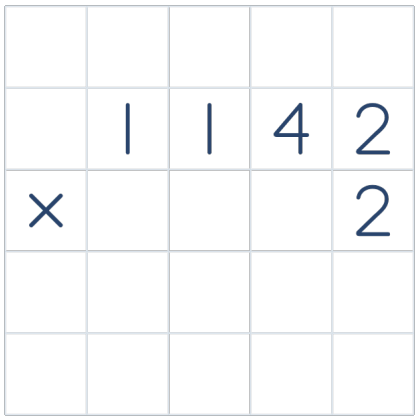
1,142 × 2 = ☐



The first digit of 1,142, 1, is in the thousands column, so we start there. Now, we write 1,142 in the correct columns, with one digit in each box.

Step 4

1,142 × 2 = ☐

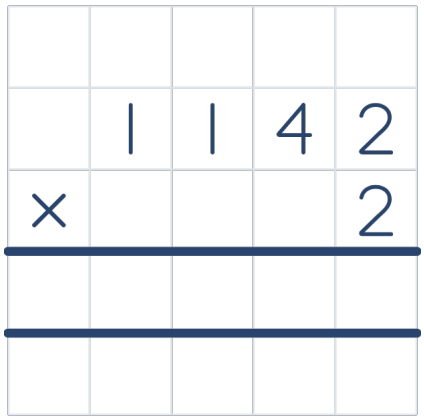


Remember: There must always be a digit in the ones column, even if it is a 0.

Then, we write the multiplication sign on the left and 2 in the ones column. We are multiplying by 2 ones.

Step 5

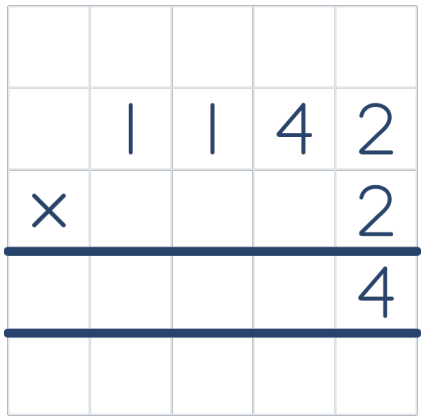
1,142 × 2 = ☐



Draw a line under 2. Leave one row for the product, then draw the second line below that row. Write exchanges below the second line.

Step 6

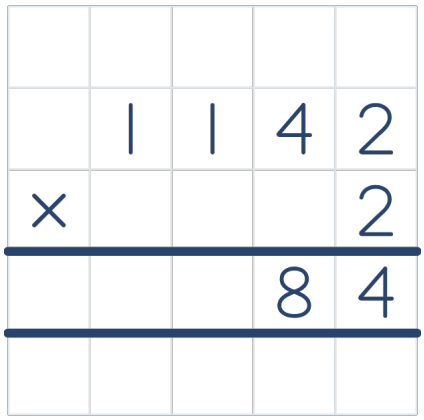
1,142 × 2 = ☐



First, we multiply the ones, the smallest place-value column. 2 ones × 2 = 4 ones. We write 4 in the ones column. No exchange is needed this time.

Step 7

1,142 × 2 = ☐

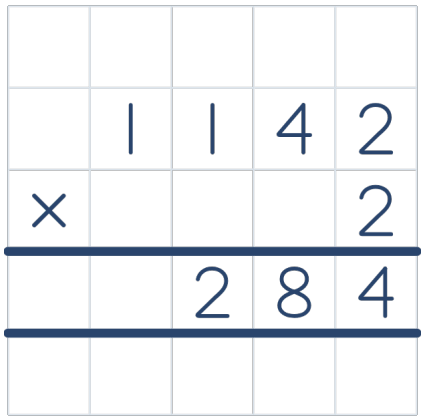


Remember: Check whether there is an exchange to add from the previous column. Include it before writing this answer.

Next, we multiply the tens. 4 tens × 2 = 8 tens. We write 8 in the tens column. No exchange is needed this time.

Step 8

1,142 × 2 = ☐

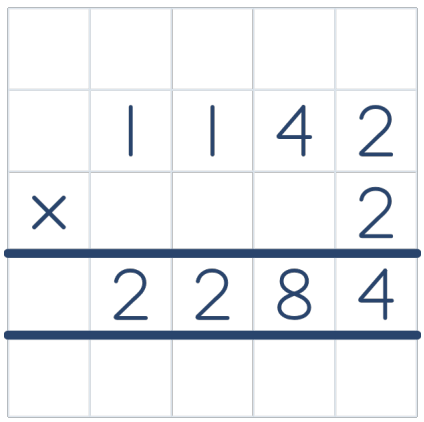


Remember: Check whether there is an exchange to add from the previous column. Include it before writing this answer.

Next, we multiply the hundreds. 1 hundred × 2 = 2 hundreds. We write 2 in the hundreds column. No exchange is needed this time.

Step 9

1,142 × 2 = ☐

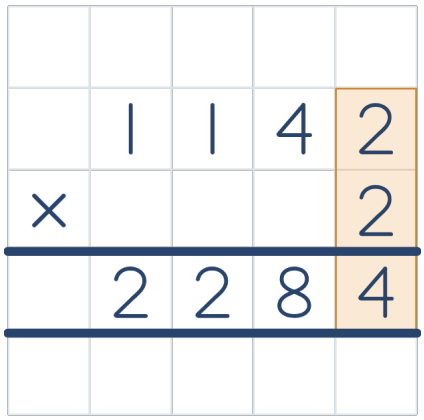


Remember: Check whether there is an exchange to add from the previous column. Include it before writing this answer.

Finally, we multiply the thousands. 1 thousand × 2 = 2 thousands. We write 2 in the thousands column. No exchange is needed this time.

Step 10

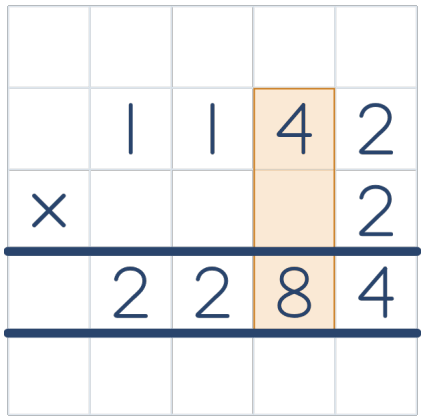
1,142 × 2 = ☐



Our product is 2,284. Before we copy our answer into the answer box, let's check each column, including the exchanges. First, we check the ones: 2 ones × 2 = 4 ones. We have correctly written 4 in the answer row, using the correct place-value columns.

Step 11

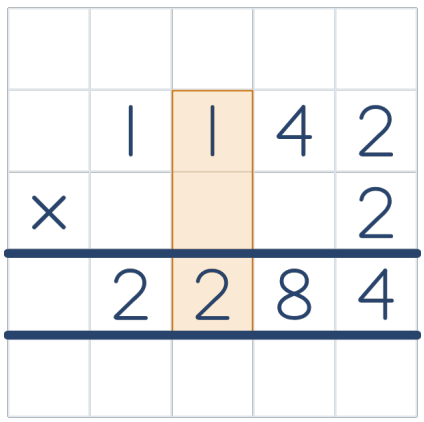
1,142 × 2 = ☐



Next, we check the tens: 4 tens × 2 = 8 tens. We have correctly written 8 in the answer row, using the correct place-value columns.

Step 12

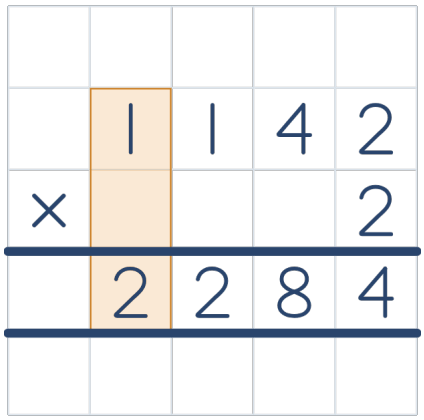
1,142 × 2 = ☐



Next, we check the hundreds: 1 hundred × 2 = 2 hundreds. We have correctly written 2 in the answer row, using the correct place-value columns.

Step 13

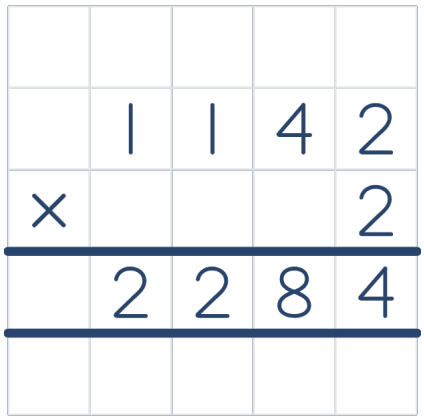
1,142 × 2 = ☐



Finally, we check the thousands: 1 thousand × 2 = 2 thousands. We have correctly written 2 in the answer row, using the correct place-value columns.

Step 14

1,142 × 2 = 2284

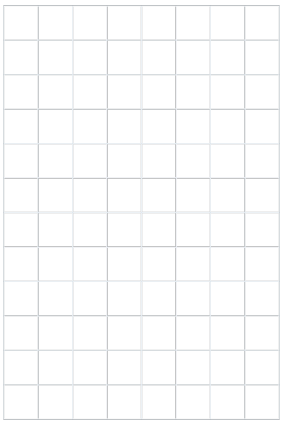


The product is 2284. Copy 2284 into the answer box. Make sure you copy the answer correctly.

Year 5 - Long Multiplication — Lesson Guide

Step 1

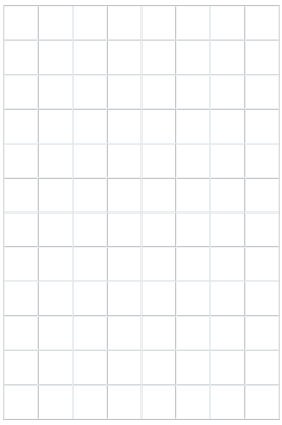
235 × 17 = ☐



First, we circle the multiplication sign so we know to multiply the two factors and find their product.

Step 2

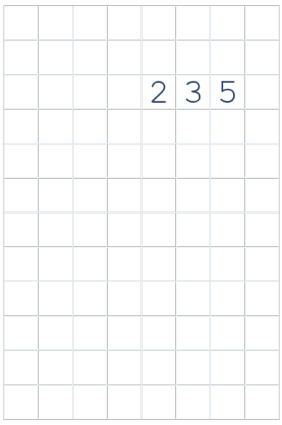
235 × 17 = ☐



First, check whether a mental method would be quicker. Split 17 into 10 and 7. The first product is 235 × 7. The second product is 235 × 10. Add the two products to find 235 × 17.

Step 3

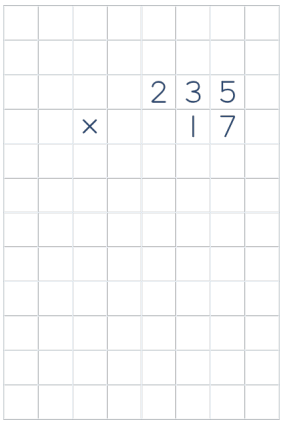
235 × 17 = ☐



The first digit of 235, 2, is in the hundreds column, so we start there. Now, we write 235 in the correct columns, with one digit in each box.

Step 4

235 × 17 = ☐

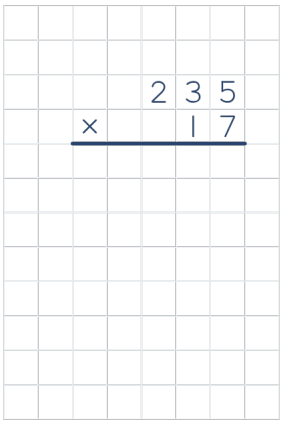


Remember: There must always be a digit in the ones column, even if it is a 0.

Then, we write the multiplication sign on the left. We write 17 below 235, with 1 in the tens column and 7 in the ones column.

Step 5

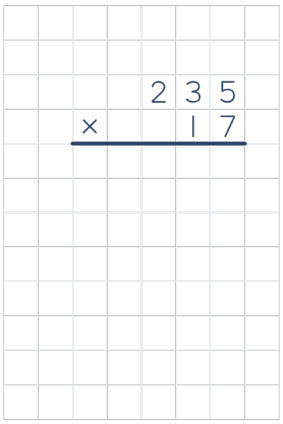
235 × 17 = ☐



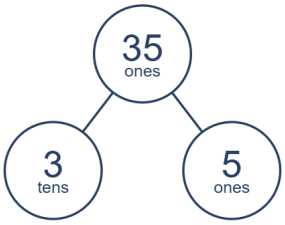
After that, we draw a line below the factors. We leave two rows for the products.

Step 6

235 × 17 = ☐

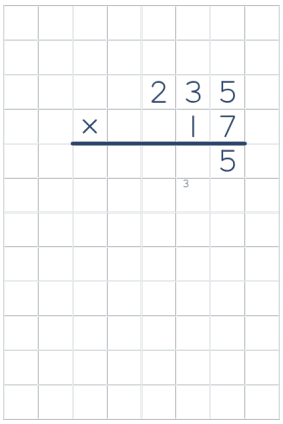


First, we multiply the ones, the smallest place-value column. 5 ones × 7 = 35 ones. As we can only write one digit per box, we partition 35 ones into 3 tens and 5 ones.



Step 7

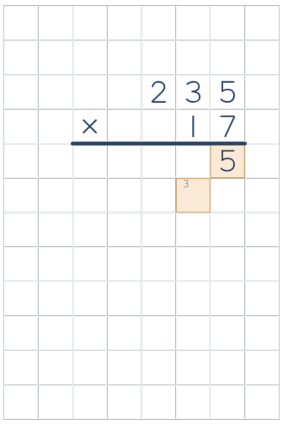
235 × 17 = ☐



We write the 3 tens in the tens column underneath the answer, ready for the next step. Then we write the remaining 5 ones in the ones square of the first product row.

Step 8

235 × 17 = ☐

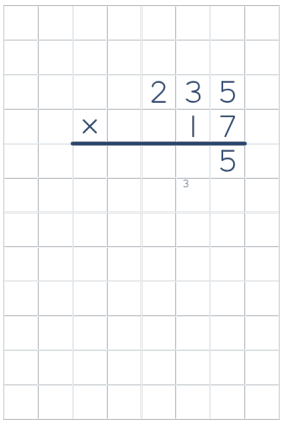


Remember: Check both places. Keep the small 3 below the tens column and the 5 in the ones answer square.

The small 3 below the tens column stands for 3 tens. The 5 in the ones answer square stands for 5 ones. Together, they make 35 ones.

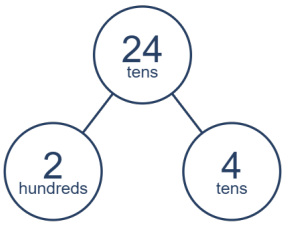
Step 9

235 × 17 = ☐



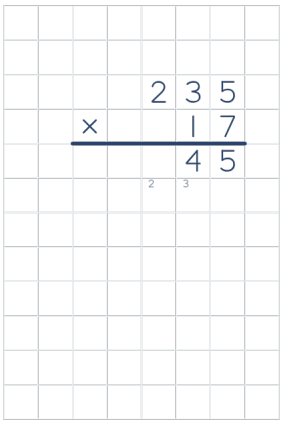
Remember: Each product has its own exchanges. Use only the small exchange digits for the product row you are working on.

Next, we multiply the tens. 3 tens × 7 = 21 tens. Add the 3 exchanged tens shown by the small 3 below the tens column. 21 tens + 3 exchanged tens = 24 tens. As we can only write one digit per box, we partition 24 tens into 2 hundreds and 4 tens.



Step 10

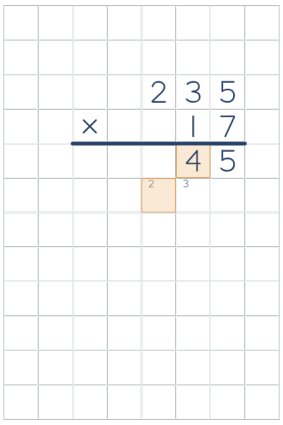
235 × 17 = ☐



We write the 2 hundreds in the hundreds column underneath the answer, ready for the next step. Then we write the remaining 4 tens in the tens square of the first product row.

Step 11

235 × 17 = ☐

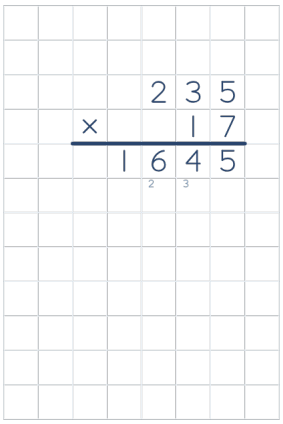


Remember: Check both places. Keep the small 2 below the hundreds column and the 4 in the tens answer square.

The small 2 below the hundreds column stands for 2 hundreds. The 4 in the tens answer square stands for 4 tens. Together, they make 24 tens.

Step 12

235 × 17 = ☐

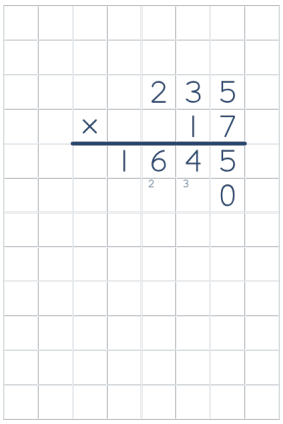


Remember: Each product has its own exchanges. Use only the small exchange digits for the product row you are working on.

Finally, we multiply the hundreds. 2 hundreds × 7 = 14 hundreds. Add the 2 exchanged hundreds shown by the small 2 below the hundreds column. 14 hundreds + 2 exchanged hundreds = 16 hundreds. This is the last column, so we write 1 thousand and 6 hundreds directly in the answer row, with one digit in each box.

Step 13

235 × 17 = ☐

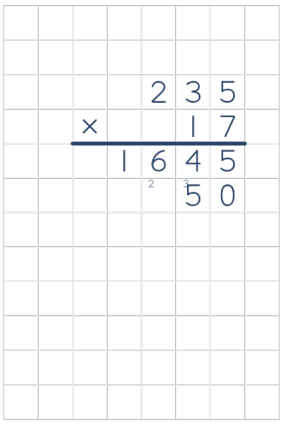


Remember: The tens digit stands for a number of tens. A product of a whole number and a number of tens has 0 ones.

The 1 in the tens column of 17 is worth 10. The second product row is for 235 × 10. Write 0 in the ones square of that row before you multiply. The zero holds the ones place.

Step 14

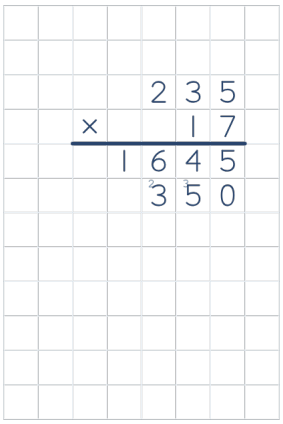
235 × 17 = ☐



First, we multiply the ones, the smallest place-value column. 5 ones × 10 = 5 tens. We write 5 in the tens square of the second product row. No exchange is needed this time.

Step 15

235 × 17 = ☐

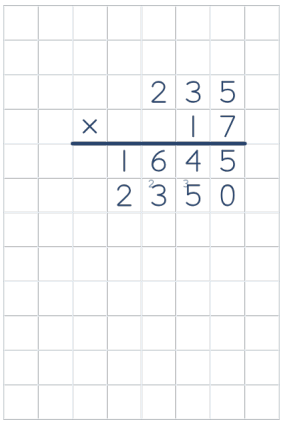


Remember: Each product has its own exchanges. Use only the small exchange digits for the product row you are working on.

Next, we multiply the tens. 3 tens × 10 = 3 hundreds. We write 3 in the hundreds square of the second product row. No exchange is needed this time.

Step 16

235 × 17 = ☐

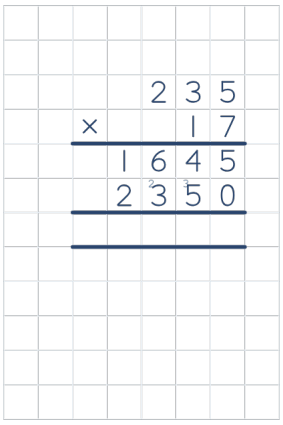


Remember: Each product has its own exchanges. Use only the small exchange digits for the product row you are working on.

Finally, we multiply the hundreds. 2 hundreds × 10 = 2 thousands. We write 2 in the thousands square of the second product row. No exchange is needed this time.

Step 17

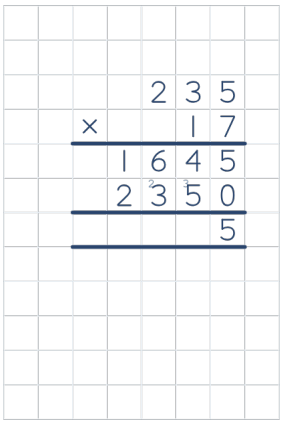
235 × 17 = ☐



Draw a line under the two products. Leave one row for the sum, then draw the second line below that row. Write exchanges below the second line.

Step 18

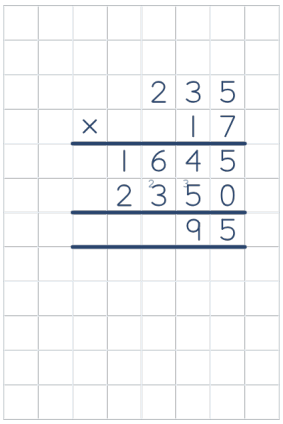
235 × 17 = ☐



First, we add the ones, the smallest place-value column. 5 ones + 0 ones = 5 ones. We write 5 in the ones answer box. No exchange is needed this time.

Step 19

235 × 17 = ☐

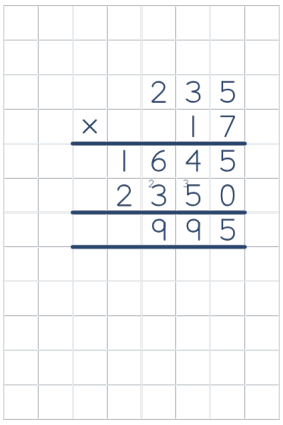


Remember: Check whether there is an exchange to add from the previous column. Include it before writing this answer.

Next, we add the tens. 4 tens + 5 tens = 9 tens. We write 9 in the tens answer box. No exchange is needed this time.

Step 20

235 × 17 = ☐

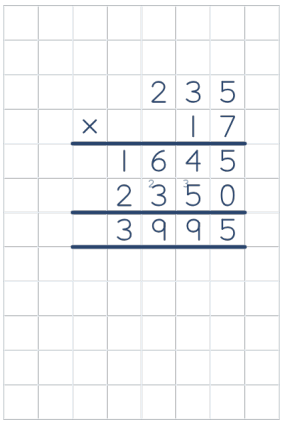


Remember: Check whether there is an exchange to add from the previous column. Include it before writing this answer.

Next, we add the hundreds. 6 hundreds + 3 hundreds = 9 hundreds. We write 9 in the hundreds answer box. No exchange is needed this time.

Step 21

235 × 17 = ☐

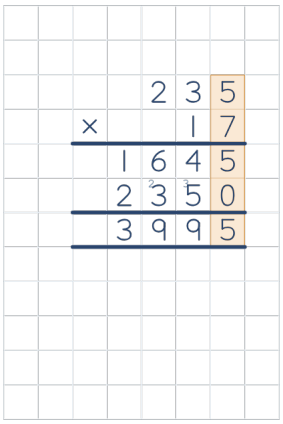


Remember: Check whether there is an exchange to add from the previous column. Include it before writing this answer.

Next, we add the thousands. 1 thousand + 2 thousands = 3 thousands. We write 3 in the thousands answer box. No exchange is needed this time.

Step 22

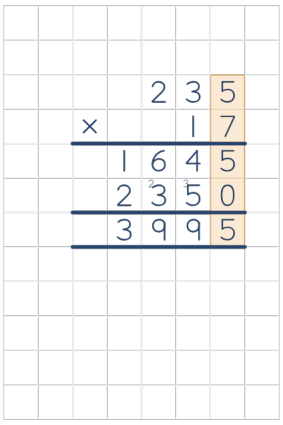
235 × 17 = ☐



Read the first product row as 1,645. It comes from 235 × 7. Read the second product row as 2,350. It comes from 235 × 10, so it ends in 0. Next, we check the sum of the two rows, one column at a time.

Step 23

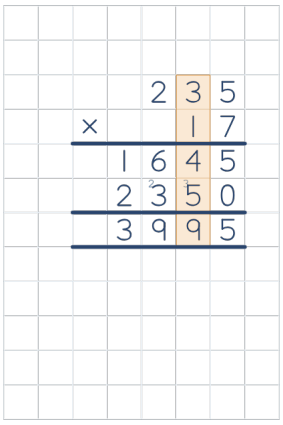
235 × 17 = ☐



We check the ones column of the sum. 5 ones + 0 ones = 5 ones. We have written 5 in the answer box.

Step 24

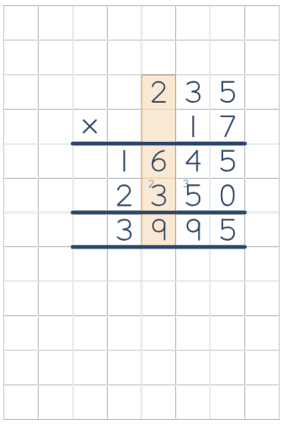
235 × 17 = ☐



We check the tens column of the sum. 4 tens + 5 tens = 9 tens. We have written 9 in the answer box.

Step 25

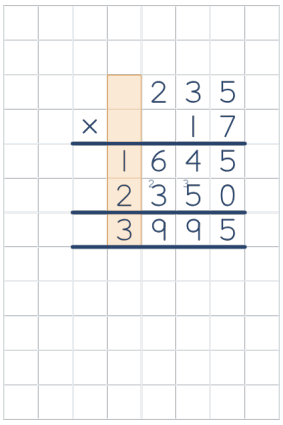
235 × 17 = ☐



We check the hundreds column of the sum. 6 hundreds + 3 hundreds = 9 hundreds. We have written 9 in the answer box.

Step 26

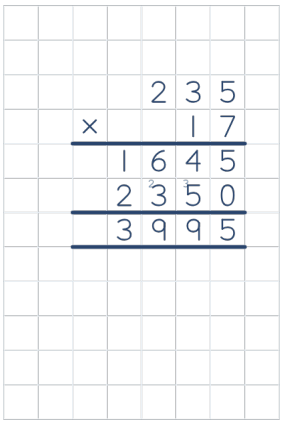
235 × 17 = ☐



We check the thousands column of the sum. 1 thousand + 2 thousands = 3 thousands. We have written 3 in the answer box.

Step 27

235 × 17 = 3995



The product is 3995. Copy 3995 into the answer box. Make sure you copy the answer correctly.

Year 5 - Short Division — Lesson Guide

Step 1

1,566 ÷ 2 = ☐

First, we circle the division sign so we know to divide and find the quotient.

Step 2

1,566 ÷ 2 = ☐

First, check whether a mental method would be quicker. I can see two exchanges, so I think short division will help.

Step 3

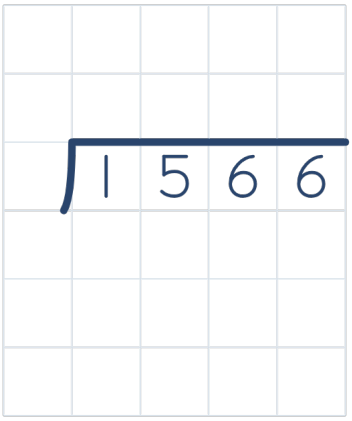
1,566 ÷ 2 = ☐



The dividend is 1,566, the number we are dividing. We leave a row above the dividend for the quotient, our answer. The first digit of 1,566, 1, is in the thousands column, so we start there. We write 1,566 in the correct columns, with one digit in each box.

Step 4

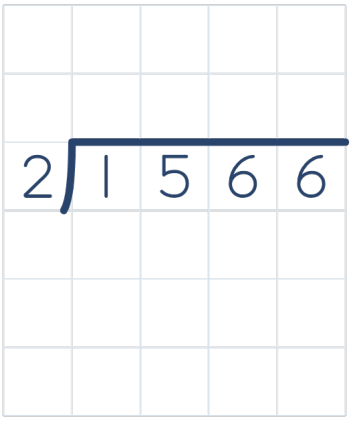
1,566 ÷ 2 = ☐



After that, we draw a short curved line on the left of the dividend and a straight line above it. We have kept the row above the line for our quotient.

Step 5

1,566 ÷ 2 = ☐

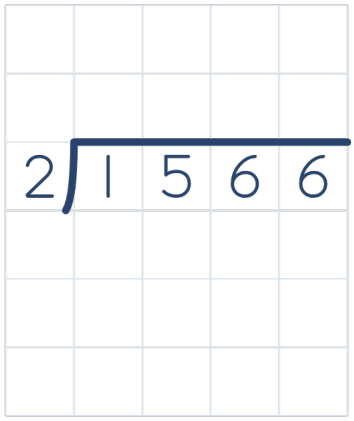


Remember: The divisor goes outside the bracket. The quotient goes above the line.

Then, we write 2 on the left of the curved line. This is the divisor, the number we are dividing by.

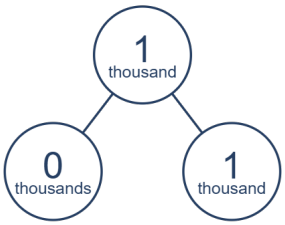
Step 6

1,566 ÷ 2 = ☐



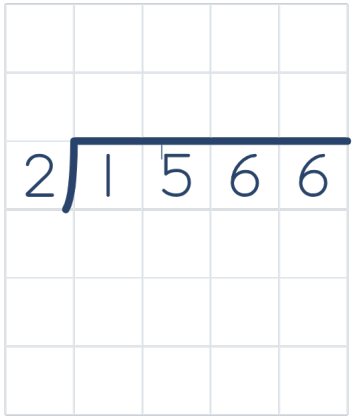
Remember: Leave unused squares before the first quotient digit empty. Once the quotient has started, write a zero when a place has no whole groups.

Start with the 1 thousand in 1,566. There are too few thousands to give each of the 2 groups one. Leave the first quotient square empty. Exchange the 1 thousand in the next step.



Step 7

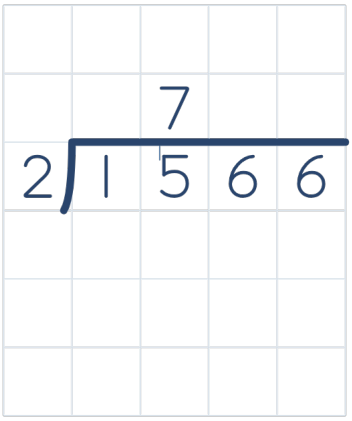
1,566 ÷ 2 = ☐



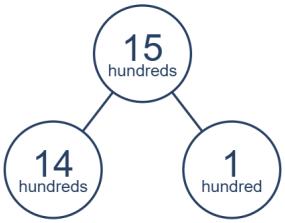
Now, we exchange the 1 thousand left over for 10 hundreds. We write a smaller 1 at the top left of the next square, to the left of the 5 already there. Together they show 15 hundreds, ready for the next step.

Step 8

1,566 ÷ 2 = ☐

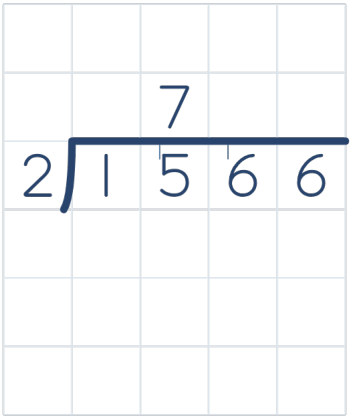


Read the small 1 and the 5 together as 15 hundreds. The small 1 stands for 10 hundreds exchanged from the thousands column. Divide 15 hundreds by 2. Each group gets 7 hundreds and 1 hundred is left over. Write 7 in the hundreds answer square above the line. We will exchange the 1 hundred left over in the next step.



Step 9

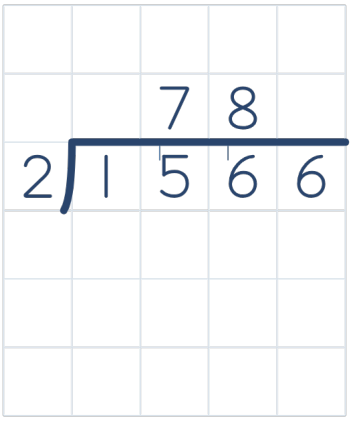
1,566 ÷ 2 = ☐



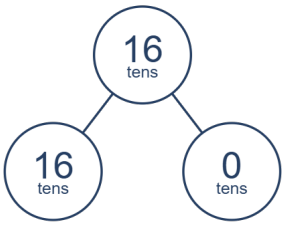
Now, we exchange the 1 hundred left over for 10 tens. We write a smaller 1 at the top left of the next square, to the left of the 6 already there. Together they show 16 tens, ready for the next step.

Step 10

1,566 ÷ 2 = ☐

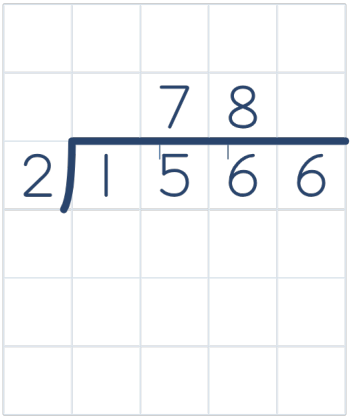


Read the small 1 and the 6 together as 16 tens. The small 1 stands for 10 tens exchanged from the hundreds column. Divide 16 tens by 2. Each group gets 8 tens. Write 8 in the tens answer square above the line.



Step 11

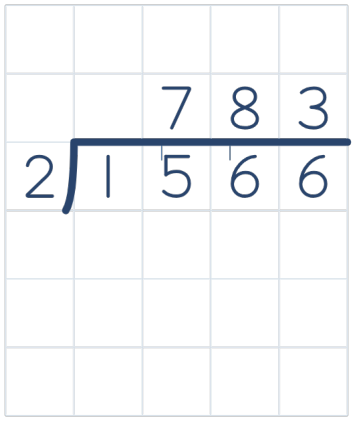
1,566 ÷ 2 = ☐



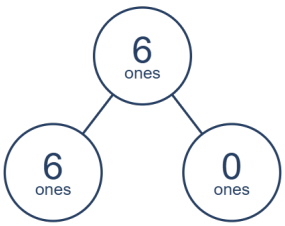
We have shared all 16 tens equally into 2 groups. There are no tens left to exchange. Move to the 6 in the ones column.

Step 12

1,566 ÷ 2 = ☐

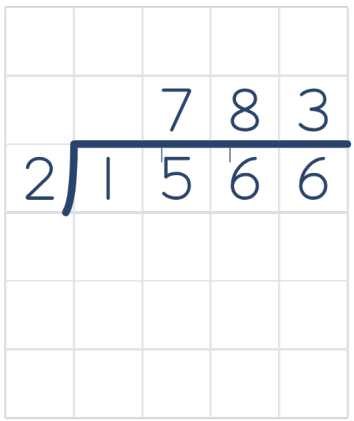


Share 6 ones equally into 2 groups. Each group gets 3 ones. Write 3 in the ones answer square above the line.



Step 13

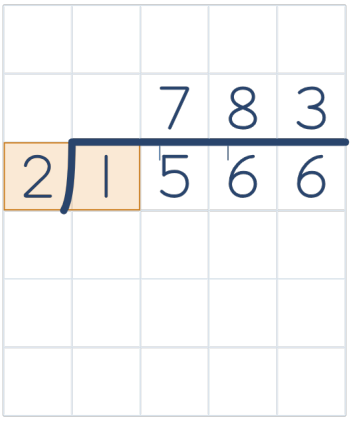
1,566 ÷ 2 = ☐



Nothing is left over, so we have finished dividing. Our quotient is 783.

Step 14

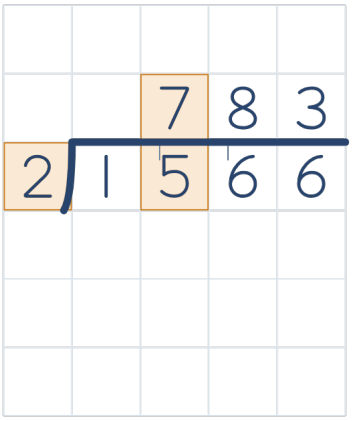
1,566 ÷ 2 = ☐



Our quotient is 783. Before we copy our answer into the answer box, let's check each column, including the exchanges. First, we check the thousands. We ask again, "How many 2s are in 1?" 0 groups of 2 make 0, with 1 left over. We have left the first quotient position empty because there are no whole groups. We have exchanged the 1 thousand left over into the next column.

Step 15

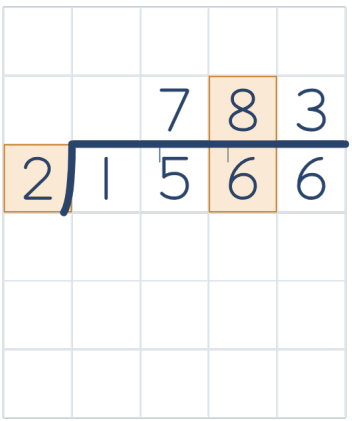
1,566 ÷ 2 = ☐



Next, we check the hundreds. We ask again, "How many 2s are in 15?" 7 groups of 2 make 14, with 1 left over. We have written 7 above this column. We have exchanged the 1 hundred left over into the next column.

Step 16

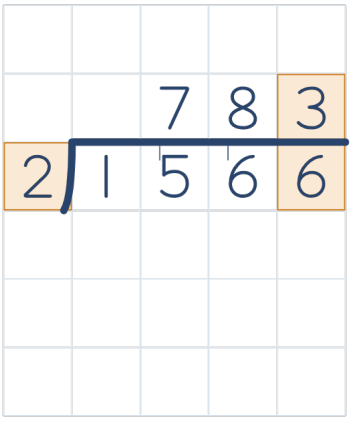
1,566 ÷ 2 = ☐



Next, we check the tens. We ask again, "How many 2s are in 16?" 8 groups of 2 make 16. We have written 8 above this column. There is nothing left over in this column.

Step 17

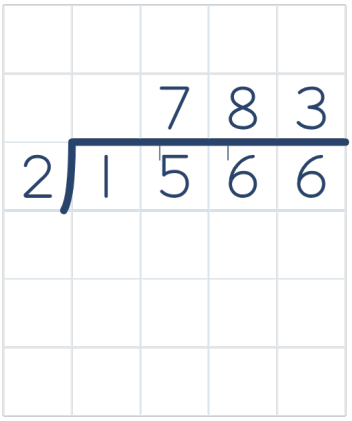
1,566 ÷ 2 = ☐



Finally, we check the ones. We ask again, “How many 2s are in 6?” 3 groups of 2 make 6. We have written 3 above this column. There is nothing left over in this column.

Step 18

1,566 ÷ 2 = **783**

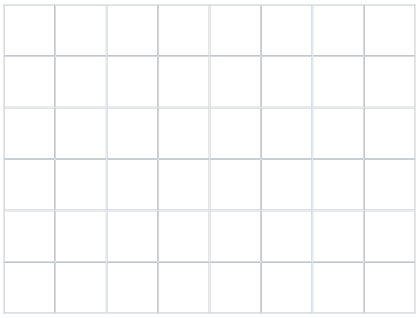


The quotient is 783. Copy 783 into the answer box. Make sure you copy the answer correctly.

Year 5 - Short Division with a Remainder — Lesson Guide

Step 1

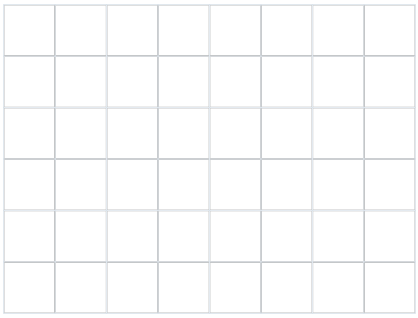
925 ÷ 4 = ☐



First, we circle the division sign so we know to divide and find the quotient.

Step 2

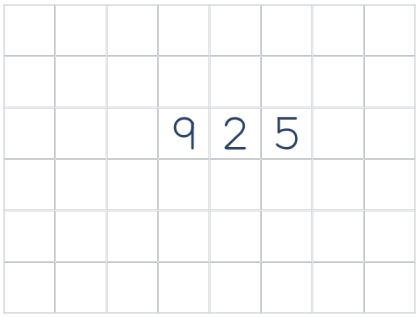
925 ÷ 4 = ☐



First, check whether a mental method would be quicker. I can see one exchange, so I think short division will help.

Step 3

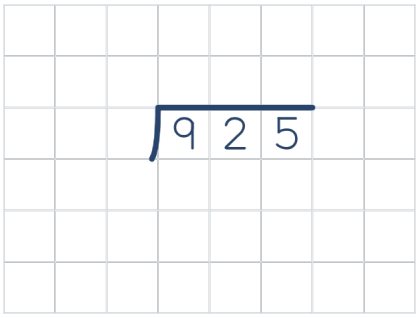
925 ÷ 4 = ☐



The dividend is 925, the number we are dividing. We leave a row above the dividend for the quotient, our answer. The first digit of 925, 9, is in the hundreds column, so we start there. We write 925 in the correct columns, with one digit in each box.

Step 4

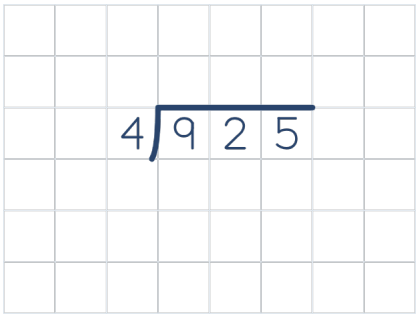
925 ÷ 4 = ☐



After that, we draw a short curved line on the left of the dividend and a straight line above it. We have kept the row above the line for our quotient.

Step 5

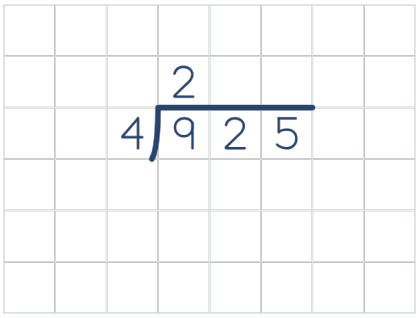
925 ÷ 4 = ☐



Then, we write 4 on the left of the curved line. This is the divisor, the number we are dividing by.

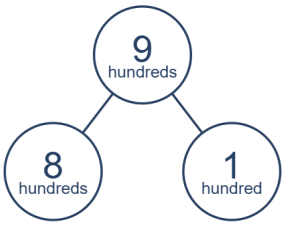
Step 6

925 ÷ 4 = ☐



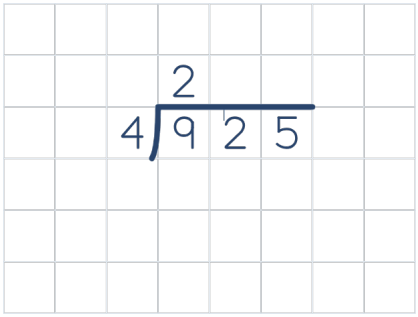
Remember: A digit above the hundreds column tells us how many hundreds are in each group.

Start at the hundreds. Share 9 hundreds equally into 4 groups. Each group gets 2 hundreds and 1 hundred is left over. Write 2 in the hundreds answer square above the line. We will exchange the 1 hundred left over in the next step.



Step 7

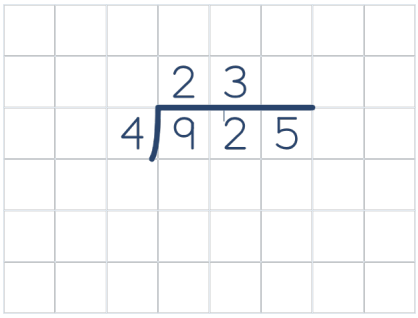
925 ÷ 4 = ☐



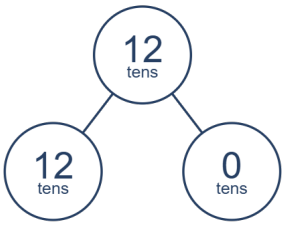
Now, we exchange the 1 hundred left over for 10 tens. We write a smaller 1 at the top left of the next square, to the left of the 2 already there. Together they show 12 tens, ready for the next step.

Step 8

925 ÷ 4 = ☐

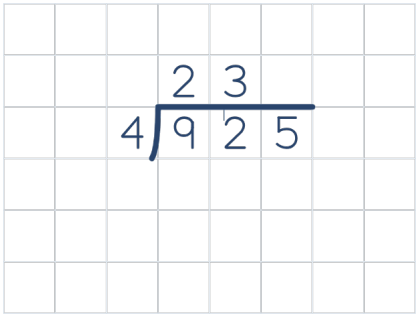


Read the small 1 and the 2 together as 12 tens. The small 1 stands for 10 tens exchanged from the hundreds column. Divide 12 tens by 4. Each group gets 3 tens. Write 3 in the tens answer square above the line.



Step 9

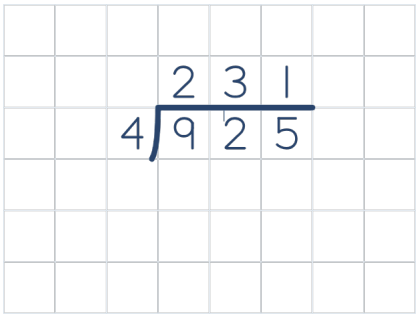
925 ÷ 4 = ☐



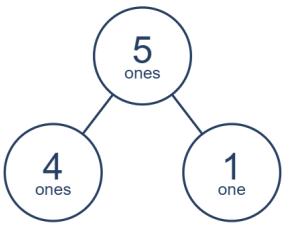
We have shared all 12 tens equally into 4 groups. There are no tens left to exchange. Move to the 5 in the ones column.

Step 10

925 ÷ 4 = ☐

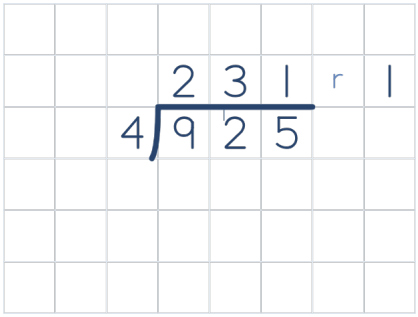


Share 5 ones equally into 4 groups. Each group gets 1 one and 1 one is left over. Write 1 in the ones answer square above the line.



Step 11

925 ÷ 4 = ☐

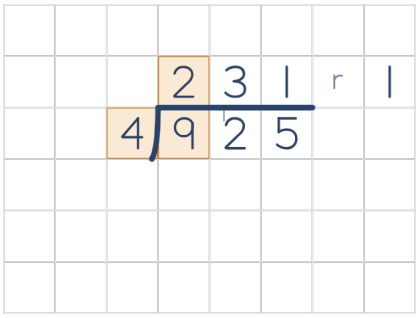


Remember: If enough is left to make another group, increase the quotient and check the remainder again.

We can make 231 groups of 4, with 1 left over. Read the quotient as 231 remainder 1. Write r followed by 1 to the right of the quotient. 1 is smaller than 4, so there is not enough for another group.

Step 12

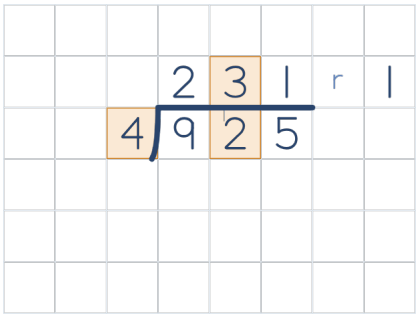
925 ÷ 4 = ☐



Our quotient is 231 with remainder 1. Before we copy our answer into the answer box, let's check each column, including the exchanges. First, we check the hundreds. We ask again, "How many 4s are in 9?" 2 groups of 4 make 8, with 1 left over. We have written 2 above this column. We have exchanged the 1 hundred left over into the next column.

Step 13

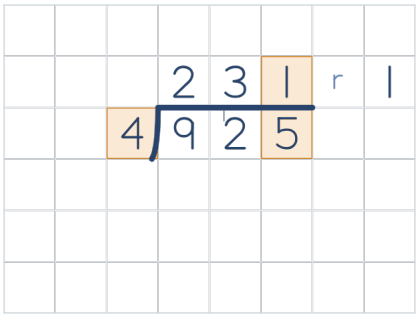
925 ÷ 4 = ☐



Next, we check the tens. We ask again, "How many 4s are in 12?" 3 groups of 4 make 12. We have written 3 above this column. There is nothing left over in this column.

Step 14

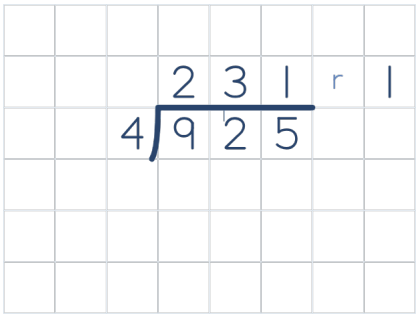
925 ÷ 4 = ☐



Finally, we check the ones. We ask again, "How many 4s are in 5?" 1 group of 4 makes 4, with 1 left over. We have written 1 above this column. The remainder, 1, is smaller than the divisor, 4.

Step 15

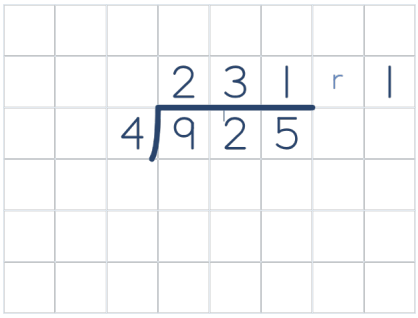
925 ÷ 4 = **231r1**



The quotient is 231, with a remainder of 1. Write 231r1 in the answer box. Make sure you copy the answer correctly.

Step 16

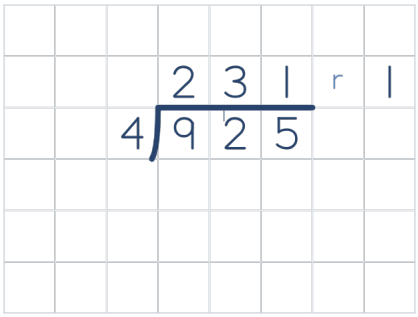
925 ÷ 4 = **231r1**



Imagine packing 925 books into boxes that hold 4 each. We can fill 231 boxes, with 1 book left over. If we need to pack every book, we need one more box. That makes 232 boxes altogether.

Step 17

925 ÷ 4 = **231r1**

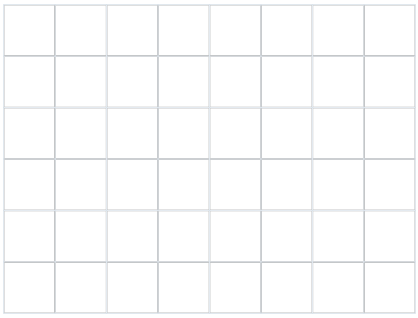


When the amount can be split further, exchange the 1 left over for 100 hundredths. Share those equally into 4 groups. Each group gets 25 hundredths, or 1 quarter, as well as 231 wholes. Each group gets 231.25 altogether.

Year 5 - Square Numbers — Lesson Guide

Step 1

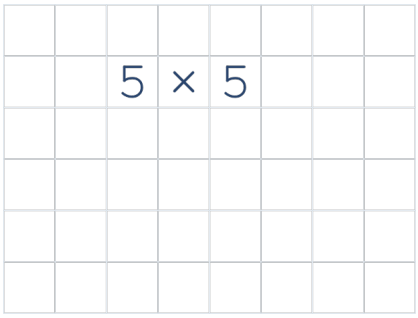
$5^2 =$ ☐



First, we circle the small 2 to show that 5 is squared.

Step 2

$5^2 =$ ☐

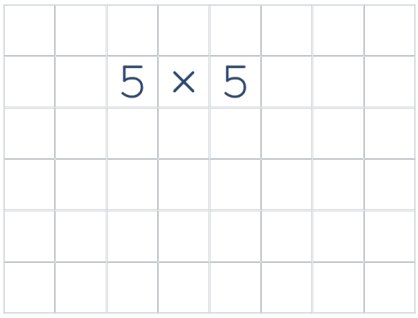


Remember: The index tells us how many copies of the base to use as factors.

Read 5^2 as 5 squared. The index is 2, so use two copies of 5 as factors. Write 5 × 5 on the next line.

Step 3

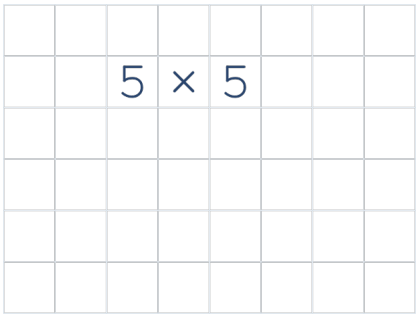
$5^2 =$ ☐



Now, we multiply 5 by 5. 5 × 5 = 25. Our square number is 25.

Step 4

$5^2 =$ **25**

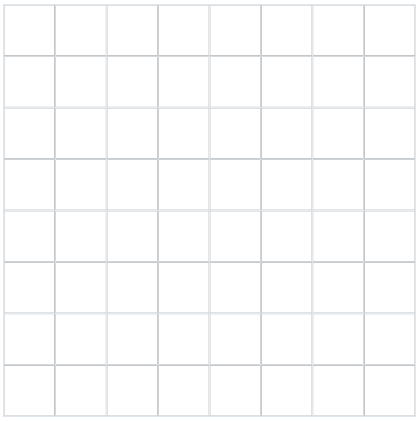


The product is 25. Copy 25 into the answer box. Make sure you copy the answer correctly.

Year 5 - Cube Numbers — Lesson Guide

Step 1

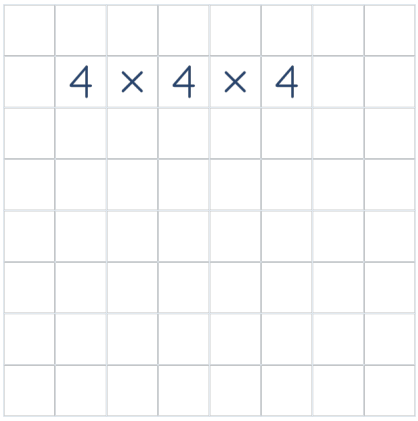
$4^3 =$ ☐



First, we circle the small 3 to show that 4 is cubed.

Step 2

$4^3 =$ ☐

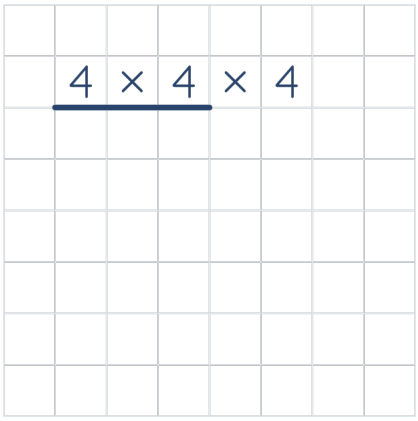


Remember: Multiply three copies of the number together.

The small 3 tells us to multiply 3 copies of 4 together. We write 4 × 4 × 4 below the question.

Step 3

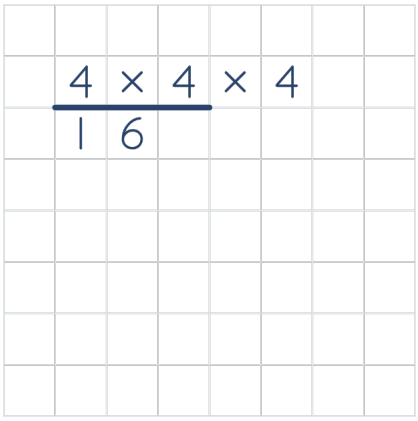
$4^3 =$ ☐



Underline the first two 4s. Multiply this pair first. Use the third 4 to multiply the result.

Step 4

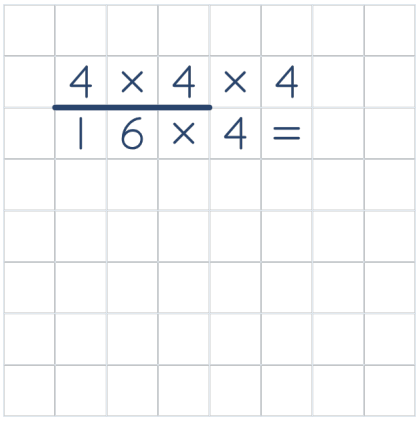
$4^3 =$ ☐



First, we multiply 4 by 4. 4 × 4 = 16. We write 16 underneath the first two factors.

Step 5

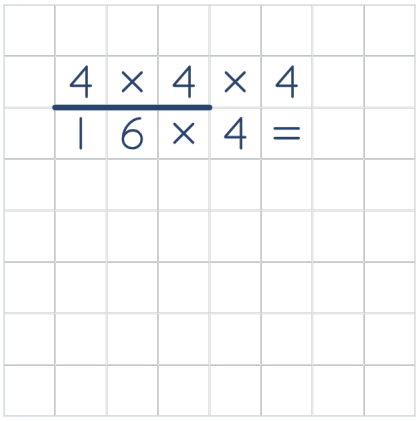
$4^3 =$ ☐



Next, we bring down the last factor, 4. We still need to multiply 16 by 4.

Step 6

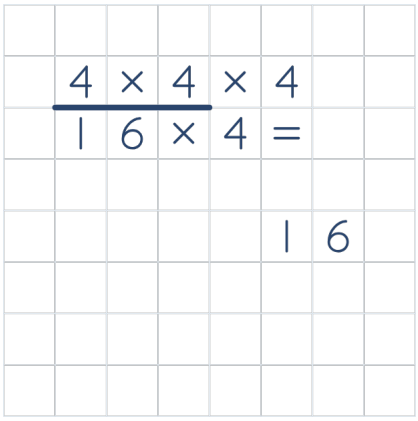
$4^3 =$ ☐



We can work out 16 × 4 mentally if we know the fact. If a written method would help, we can use column multiplication. Let’s follow that method now.

Step 7

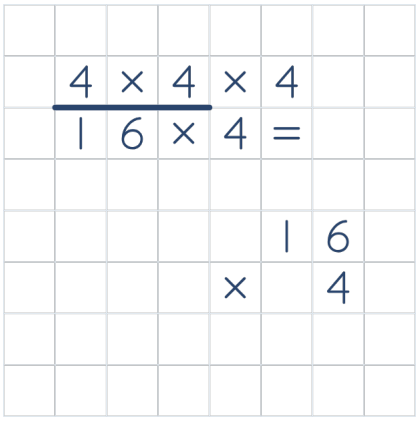
$4^3 =$ ☐



The first digit of 16, 1, is in the tens column, so we start there. Now, we write 16 in the correct columns, with one digit in each box.

Step 8

$4^3 =$ ☐

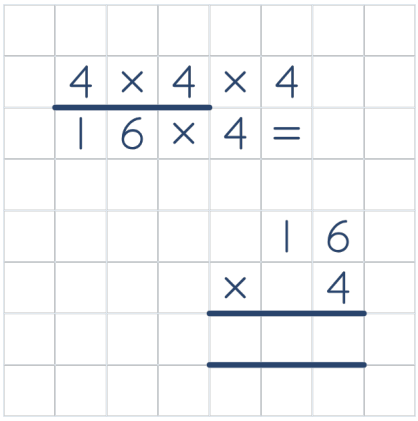


Remember: There must always be a digit in the ones column, even if it is a 0.

Then, we write the multiplication sign on the left and 4 in the ones column. We are multiplying by 4 ones.

Step 9

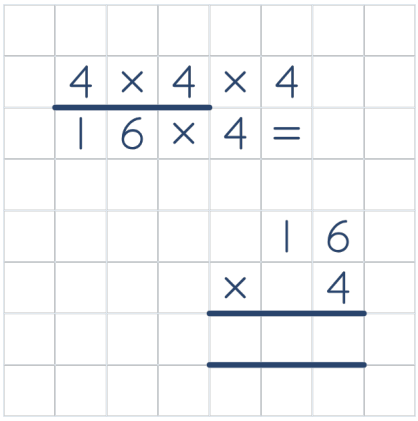
$4^3 =$ ☐



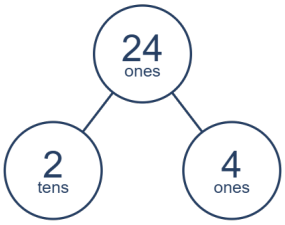
Draw a line under 4. Leave one row for the product, then draw the second line below that row. Write exchanges below the second line.

Step 10

$4^3 =$ ☐

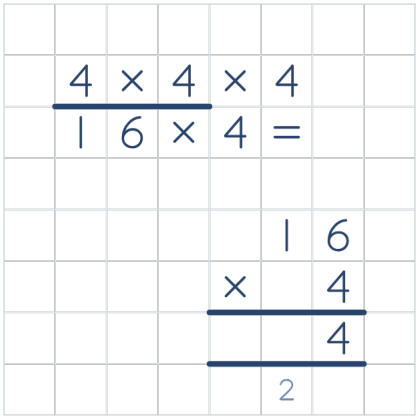


First, we multiply the ones, the smallest place-value column. 6 ones × 4 = 24 ones. As we can only write one digit per box, we partition 24 ones into 2 tens and 4 ones.



Step 11

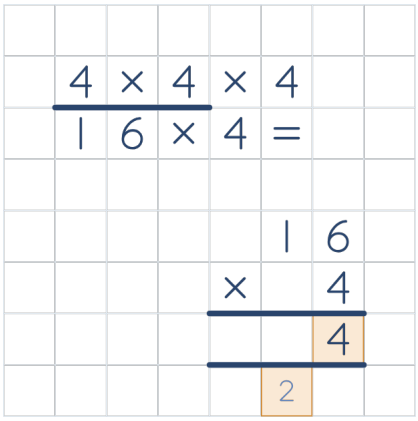
$4^3 =$ ☐



We write the 2 tens in the tens column underneath the answer, ready for the next step. Then we write the remaining 4 ones in the ones answer box.

Step 12

4^3 =

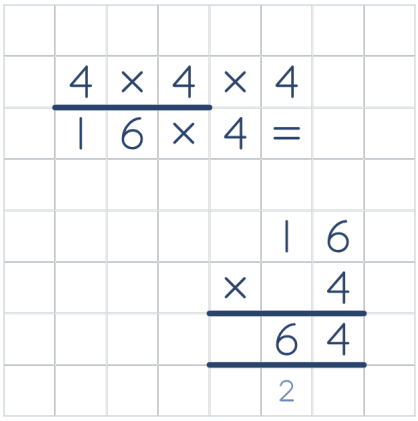


Remember: Check both places. Keep the small 2 below the tens column and the 4 in the ones answer square.

The small 2 below the tens column stands for 2 tens. The 4 in the ones answer square stands for 4 ones. Together, they make 24 ones.

Step 13

4^3 =

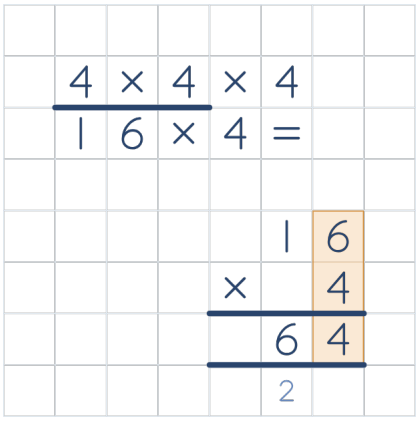


Remember: Look below the column you are working on. Add the exchanged amount written there.

Finally, we multiply the tens. 1 ten × 4 = 4 tens. Add the 2 exchanged tens shown by the small 2 below the tens column. 4 tens + 2 exchanged tens = 6 tens. We write 6 in the tens column. No exchange is needed this time.

Step 14

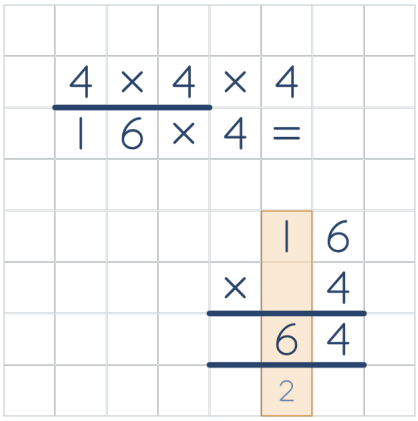
4^3 =



Our product is 64. Before we copy our answer into the answer box, let's check each column, including the exchanges. First, we check the ones: 6 ones × 4 = 24 ones. We have correctly written 2 tens underneath and 4 ones in the answer row.

Step 15

4^3 = ☐

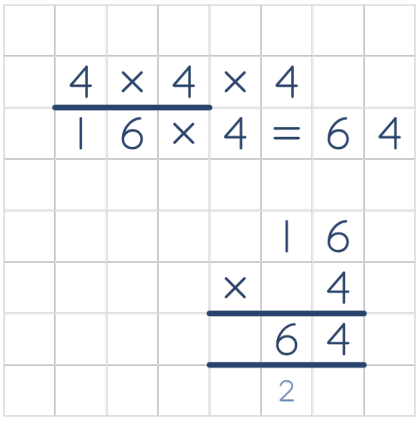


Remember: Look below the column you are working on. Add the exchanged amount written there.

Finally, we check the tens: 1 ten × 4 = 4 tens. Add the 2 exchanged tens shown by the small 2 below the tens column. 4 tens + 2 exchanged tens = 6 tens. We have correctly written 6 in the answer row, using the correct place-value columns.

Step 16

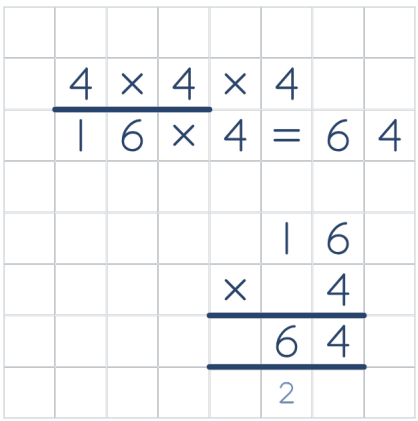
4^3 = ☐



Now, we complete the calculation. 16 × 4 = 64.

Step 17

4^3 = **64**

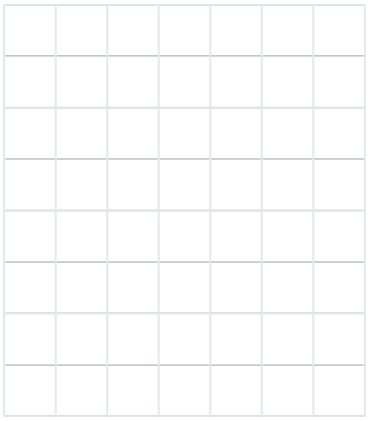


The product is 64. Copy 64 into the answer box. Make sure you copy the answer correctly.

Year 5 - Finding Missing Numbers (+ and –) — Lesson Guide

Step 1

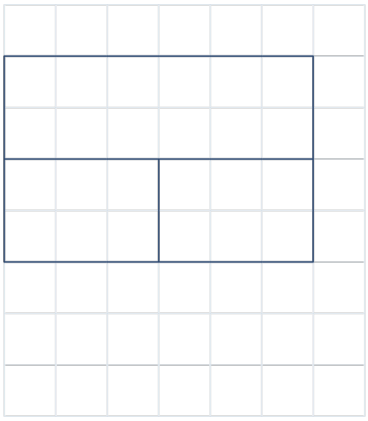
□ – 415 = 312



First, we circle the minus sign. We look at the operation in the question before choosing how to find the missing number.

Step 2

□ – 415 = 312

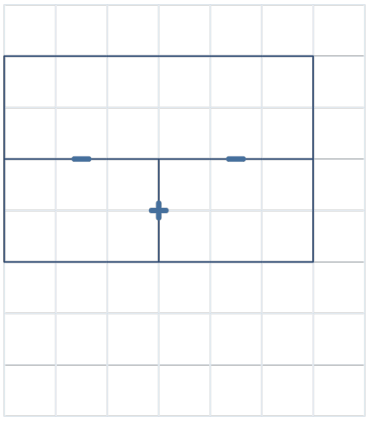


Remember: The box asks for a missing number. Put it back in the same place to check.

Read the calculation with the blank. Something take away 415 leaves 312. We are finding the whole we started with, called the minuend. Draw the whole bar above the two parts.

Step 3

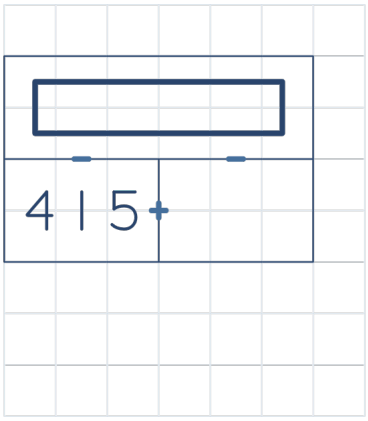
□ – 415 = 312



Next, we draw bold minus signs between the whole and its parts, and a bold plus sign between the two parts. This shows us that the two parts add to make the whole and, to find a part, we subtract the other part from the whole.

Step 4

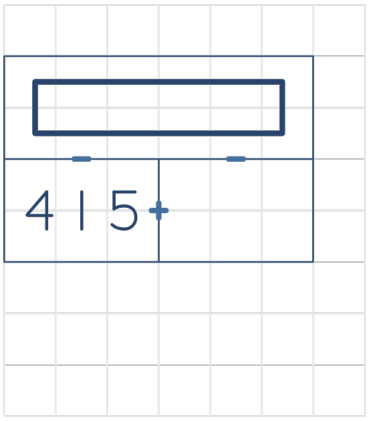
□ – 415 = 312



Draw an empty box in the whole bar for the missing number. Write 415 in the left part.

Step 5

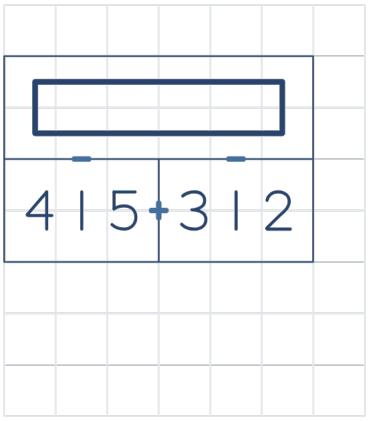
□ – 415 = 312



Check the two entries before filling the last space. Read the question up to the equals sign as something take away 415. In the bar model, the blank in the whole bar and 415 in the left part should read as something take away 415. If the entries match, fill the last space. If they differ, correct the model first.

Step 6

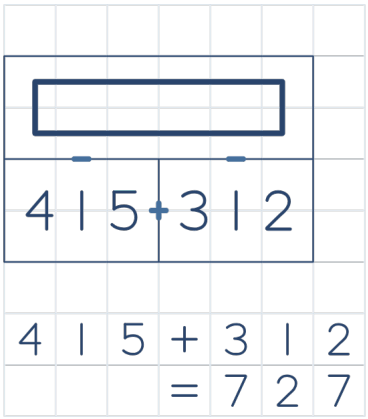
□ – 415 = 312



Write 312 in the right part.

Step 7

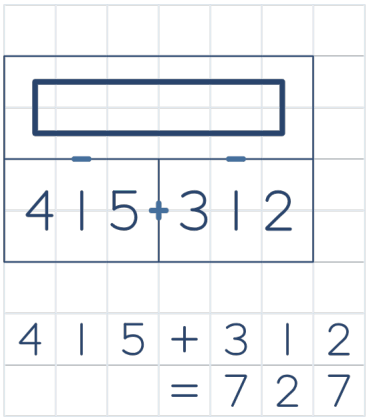
□ – 415 = 312



We add the two parts to find the whole. I can partition 312 into 300 and 10 and 2. I am going to add these parts mentally, starting with the greatest place value. 415 + 312 = 727.

Step 8

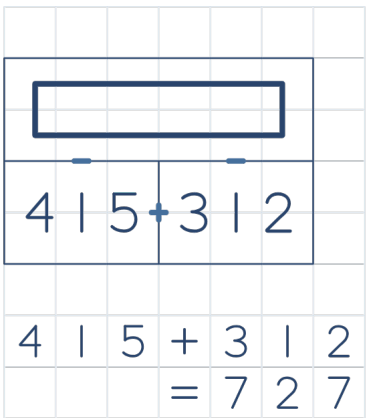
727 – 415 = 312



Now, we put 727 into the blank in the original question. Make sure you copy the answer correctly.

Step 9

727 – 415 = 312



Put 727 in the blank and use the operation in the question. Work out 727 – 415. That gives 312. The result matches 312 on the right. If you get a different number, check that you used the operation in the question. Then work it out again.

Year 5 - Finding Missing Numbers (× and ÷) — Lesson Guide

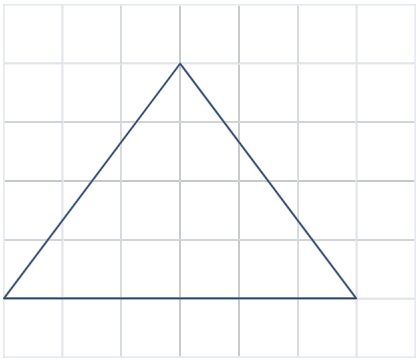
Step 1

$\square \div 5 = 12$

First, we circle the division sign. We look at the operation in the question before choosing how to find the missing number.

Step 2

$\square \div 5 = 12$

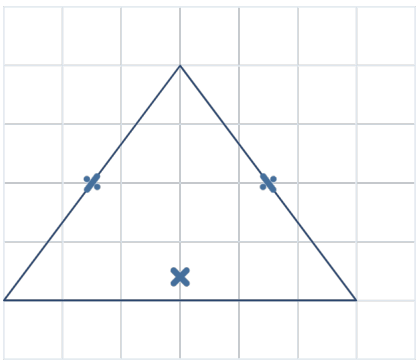


Remember: The product goes at the top. The factors go at the bottom.

We are finding the amount we started with. Sharing that amount into 5 equal groups gives 12 in each group. Draw the product-factor triangle. The missing whole goes at the top. The two known factors go at the bottom.

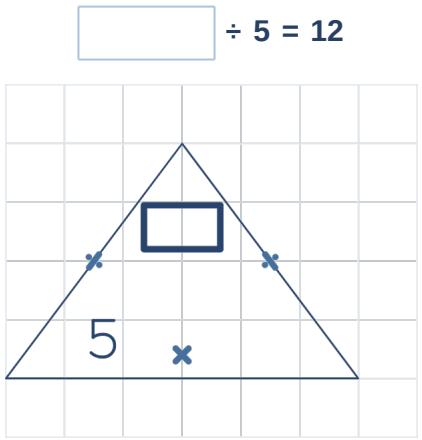
Step 3

$\square \div 5 = 12$



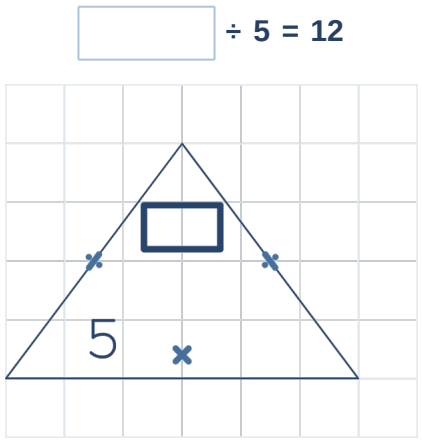
Next, we draw bold division signs over the two sloping sides and a bold multiplication sign just above the base. The factors multiply to make the product. To find a factor, we divide the product by the other factor.

Step 4



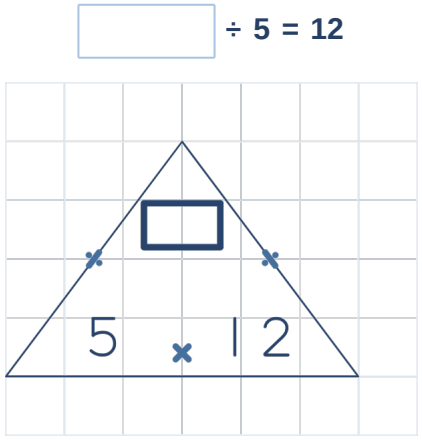
Next, we use our product-factor triangle to show something divided by 5. Our first two entries are on either side of the division sign. The first is the dividend, the product in the related multiplication. The second is the divisor, one of the factors. We draw a small rectangle at the top, in the product position for the missing dividend. We write 5 in the bottom-left corner.

Step 5



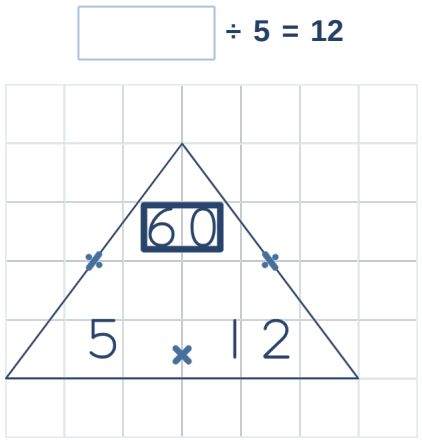
Before moving on, let's make sure our first two entries are in the right places. First, we read the calculation: something divided by 5. Then, we read the matching calculation in our product-factor triangle: something divided by 5. If they match, well done. If they do not, edit the model and check it again.

Step 6



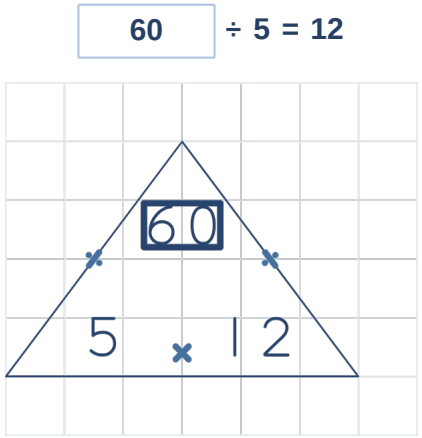
Now the calculation is in the correct place, we can look at our quotient, 12. We write 12 in the bottom-right corner.

Step 7



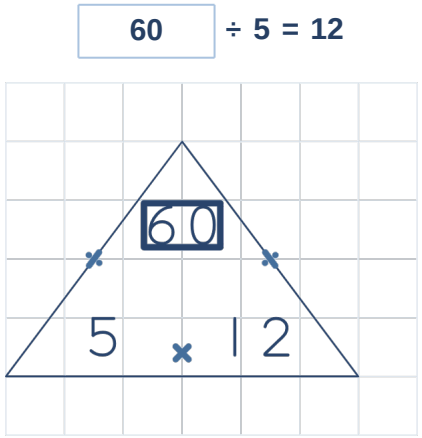
The top of the triangle is blank, so we multiply the two factors at the bottom. 5 × 12 = 60. The missing product is 60.

Step 8



Now, we put 60 into the blank in the original question. Make sure you copy the answer correctly.

Step 9



Put 60 back in the blank. Use the product-factor triangle to check the calculation. Multiply the factors. 5 × 12 = 60. So 60 shared into 5 equal groups gives 12 in each group. If you get a different number, check that you used the operation in the question. Then work it out again.

Year 5 - Dividing by 10, 100 and 1,000 — Lesson Guide

Step 1

11.1 ÷ 100 = ☐

First, we circle the division sign so we know which operation is in the question.

Step 2

11.1 ÷ 100 = ☐

Remember: The decimal point stays between the ones and tenths.

Next, we underline the 100 so we do not accidentally divide by the wrong amount. We can use place value instead of a column method. Each digit becomes worth one hundredth as much. The decimal point stays between the ones and tenths columns.

Step 3

11.1 ÷ 100 = ☐

TH	H	T	O		t	h	th

Next, we write the place-value headings, with one heading in each box. The ones are immediately to the left of the decimal point. Tenths come first on the right. Next are hundredths, with 100 to a whole. Then come thousandths, with 1,000 to a whole.

Step 4

11.1 ÷ 100 = ☐

TH	H	T	O		t	h	th
		1	1	.	1		

Now, we write 11.1 in the correct columns, with one digit in each box. We keep its original place values.

Step 5

11.1 ÷ 100 = ☐

TH	H	T	O		t	h	th
		1	1	.	1		
			0	.			

The hundreds column in 11.1 is empty. After dividing, that empty place gives us 0 ones. Write 0 in the ones place, then put a decimal point straight after the ones digit in our answer box. Each digit is worth one hundredth as much.

Step 6

11.1 ÷ 100 = ☐

TH	H	T	O		t	h	th
		1	1	.	1		
			0	.	1		

The 1 in the tens column stands for 1 ten. Dividing by 100 makes it 1 tenth. Write 1 in the tenths place, straight after the decimal point. Each digit is worth one hundredth as much.

Step 7

11.1 ÷ 100 = ☐

TH	H	T	O		t	h	th
		1	1	.	1		
			0	.	1	1	

The 1 in the ones column stands for 1 one. Dividing by 100 makes it 1 hundredth. Write 1 in the hundredths place. Each digit is worth one hundredth as much.

Step 8

11.1 ÷ 100 = ☐

TH	H	T	O		t	h	th
		1	1	.	1		
			0	.	1	1	1

The 1 in the tenths column stands for 1 tenth. Dividing by 100 makes it 1 thousandth. Write 1 in the thousandths place. Each digit is worth one hundredth as much.

Step 9

11.1 ÷ 100 = **0.111**

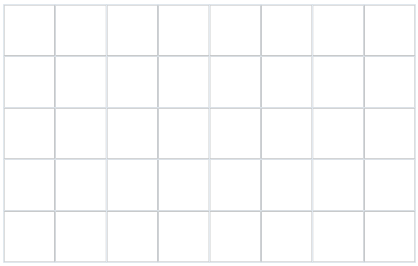
TH	H	T	O		t	h	th
		1	1	.	1		
			0	.	1	1	1

Read the answer as 0.111. The 1 is in the tenths place, the 1 is in the hundredths place and the 1 is in the thousandths place. The 0 shows there are no whole ones. Copy 0.111 into our answer box. Make sure you copy the answer correctly.

Year 5 - Multiplying by 10, 100 and 1,000 — Lesson Guide

Step 1

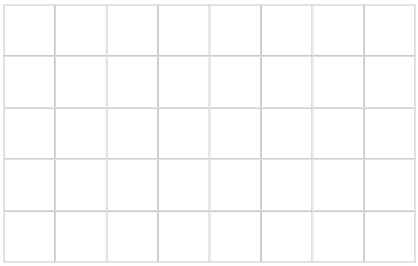
1.13 × 100 = ☐



First, we circle the multiplication sign so we know which operation is in the question.

Step 2

1.13 × 100 = ☐

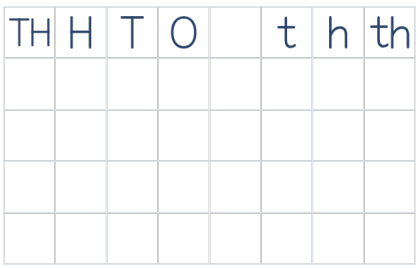


Remember: The decimal point stays between the ones and tenths.

Next, we underline the 100 so we do not accidentally multiply by the wrong amount. We can use place value instead of a column method. Each digit becomes worth 100 times as much. The decimal point stays between the ones and tenths columns.

Step 3

1.13 × 100 = ☐



Next, we write the place-value headings, with one heading in each box. The ones are immediately to the left of the decimal point. Tenths come first on the right. Next are hundredths, with 100 to a whole. Then come thousandths, with 1,000 to a whole.

Step 4

1.13 × 100 = ☐

TH	H	T	O		t	h	th
			1	.	1	3	

Now, we write 1.13 in the correct columns, with one digit in each box. We keep its original place values.

Step 5

1.13 × 100 = ☐

TH	H	T	O		t	h	th
			1	.	1	3	
	1						

Remember: Move every digit the same number of places. The order of the digits stays the same.

The 1 in the ones column stands for 1 one. Multiplying by 100 makes it 1 hundred. Write 1 in the hundreds column.

Step 6

1.13 × 100 = ☐

TH	H	T	O		t	h	th
			1	.	1	3	
	1	1					

Remember: Move every digit the same number of places. The order of the digits stays the same.

The 1 in the tenths column stands for 1 tenth. Multiplying by 100 makes it 1 ten. Write 1 in the tens column. The 1 is already in the hundreds column.

Step 7

1.13 × 100 = ☐

TH	H	T	O		t	h	th
			1	.	1	3	
	1	1	3				

Remember: Move every digit the same number of places. The order of the digits stays the same.

The 3 in the hundredths column stands for 3 hundredths. Multiplying by 100 makes it 3 ones. Write 3 in the ones column. The 1 is already in the tens column.

Step 8

1.13 × 100 = 113

TH	H	T	O		t	h	th
			1	.	1	3	
	1	1	3				

Now, we check each digit is in the correct column. Our product is 113. We copy it into the answer box. Make sure you copy the answer correctly.

Year 5 - Finding Fractions of Amounts (Unit) — Lesson Guide

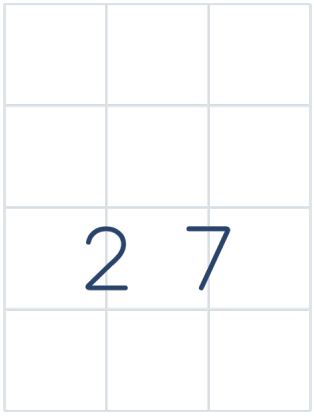
Step 1

Find $\frac{1}{3}$ of 81 = ☐

1/3 means we want 1 out of 3 equal parts. The denominator, 3, tells us how many equal parts make the whole. The numerator, 1, tells us how many of those parts we want. We want fewer than all 3 equal parts, so our answer must be less than 81.

Step 2

Find $\frac{1}{3}$ ✓ of 81 ✓ = ☐

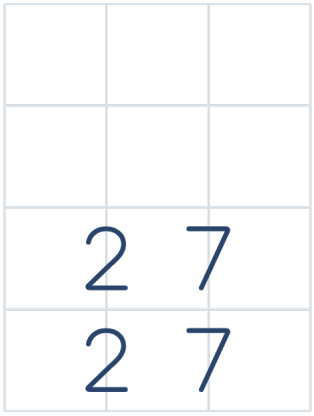


Remember: The denominator tells us how many equal parts to make. Use the numerator in the next step.

Divide the whole amount, 81, by the denominator, which is 3. Tick 81 and the denominator, 3, as you use them. 81 ÷ 3 = 27. One equal part contains 27. Keep that amount for the next step. You can work this out mentally or on the squares.

Step 3

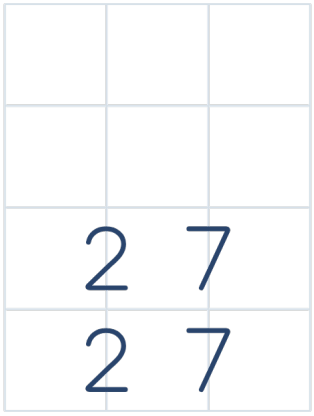
Find $\frac{1}{3}$ ✓ of 81 ✓ = ☐



We found 27 in one equal part. Multiply 27 by the numerator, which is 1. 27 × 1 = 27. Tick the numerator, 1. The fraction amount is 27. You can work this out mentally or on the squares.

Step 4

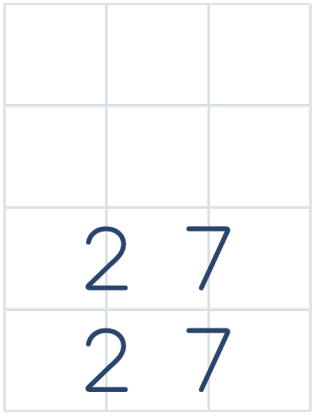
Find $\frac{1}{3}$ of 81 = ☐



Now, we check all three ticks. We started with 81. We divided by 3. Then, we multiplied by 1.

Step 5

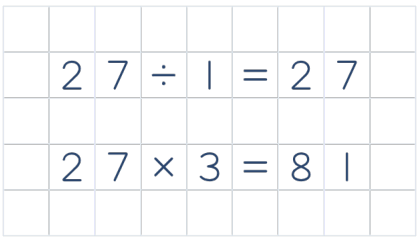
Find $\frac{1}{3}$ of 81 = **27**



The fraction amount is 27. Copy 27 into the answer box. Make sure you copy the answer correctly.

Step 6

Find $\frac{1}{3}$ of 81 = **27**



Divide 27 by the numerator, 1, to get one equal part. 27 ÷ 1 = 27. Multiply 27 by the denominator, 3, to put the equal parts back together. 27 × 3 = 81. We got back to the original whole amount, 81. That checks our answer of 27.

Year 5 - Finding Fractions of Amounts (Non-unit) — Lesson Guide

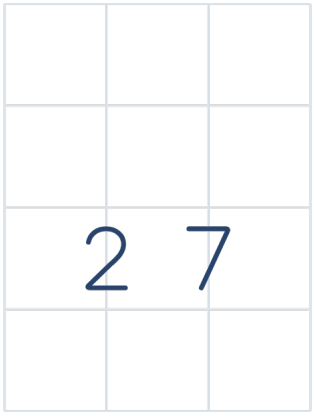
Step 1

Find $\frac{2}{3}$ of 81 = ☐

2/3 means we want 2 out of 3 equal parts. The denominator, 3, tells us how many equal parts make the whole. The numerator, 2, tells us how many of those parts we want. We want fewer than all 3 equal parts, so our answer must be less than 81.

Step 2

Find $\frac{2}{3}$ of 81 = ☐

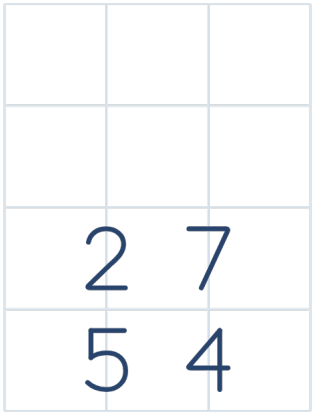


Remember: The denominator tells us how many equal parts to make. Use the numerator in the next step.

Divide the whole amount, 81, by the denominator, which is 3. Tick 81 and the denominator, 3, as you use them. 81 ÷ 3 = 27. One equal part contains 27. Keep that amount for the next step. You can work this out mentally or on the squares.

Step 3

Find $\frac{2}{3}$ of 81 = ☐

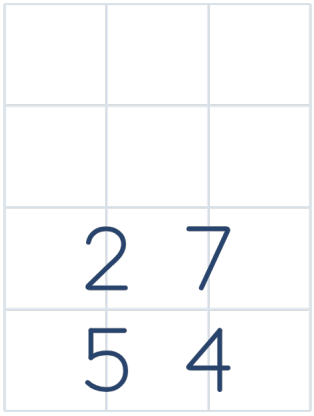


Remember: Always multiply by the numerator, even when it is 1. Keep the same habit for every fraction of an amount.

We found 27 in one equal part. Multiply 27 by the numerator, which is 2. 27 × 2 = 54. Tick the numerator, 2. The fraction amount is 54. You can work this out mentally or on the squares.

Step 4

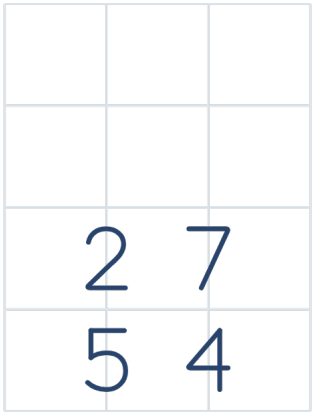
Find $\frac{2}{3}$ of 81 =



Now, we check all three ticks. We started with 81. We divided by 3. Then, we multiplied by 2.

Step 5

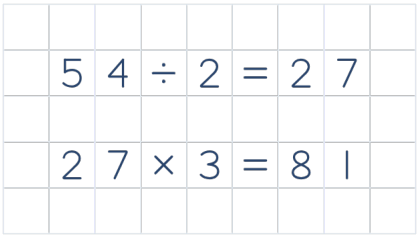
Find $\frac{2}{3}$ of 81 = **54**



The fraction amount is 54. Copy 54 into the answer box. Make sure you copy the answer correctly.

Step 6

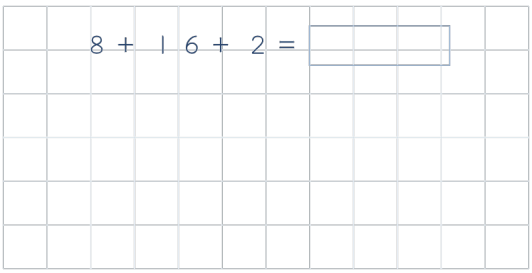
Find $\frac{2}{3}$ of 81 = **54**



Divide 54 by the numerator, 2, to get one equal part. 54 ÷ 2 = 27. Multiply 27 by the denominator, 3, to put the equal parts back together. 27 × 3 = 81. We got back to the original whole amount, 81. That checks our answer of 54.

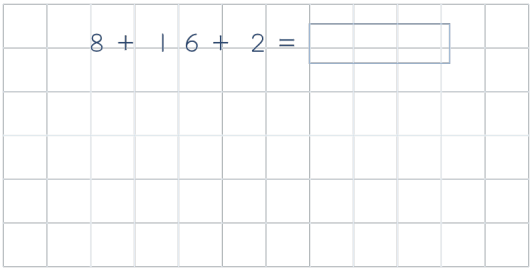
Year 5 - Adding 3 Numbers — Lesson Guide

Step 1



First, we circle both plus signs in the question. There are two additions, so we will calculate in two steps.

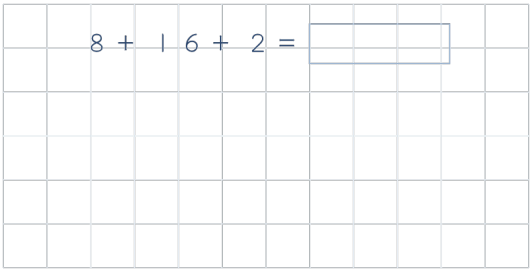
Step 2



Remember: Look at all three numbers. Use each original number once.

Addition is commutative, which means we can add the numbers in any order and get the same sum. Let's look for a pair that is easy to work out first.

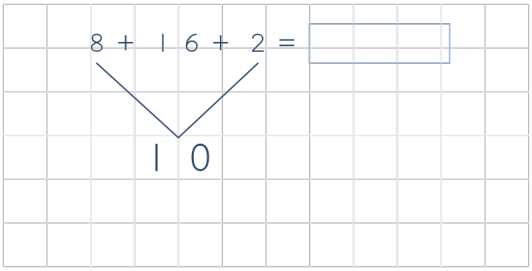
Step 3



Remember: Use each original number once.

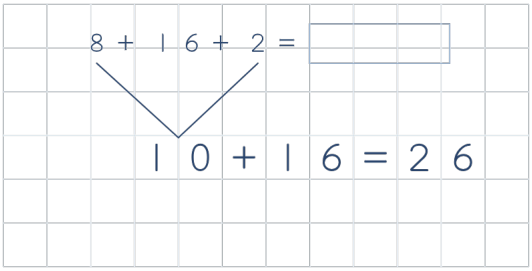
Use number bonds, doubles and other number facts to choose a helpful pair. A useful pair here is 8 and 2. 8 + 2 = 10. That gives us a multiple of 10, which is easy to add to. Draw a line from each chosen number to where we will write the first result. Keep 16 for the next step. Other pairs can still give the same sum.

Step 4



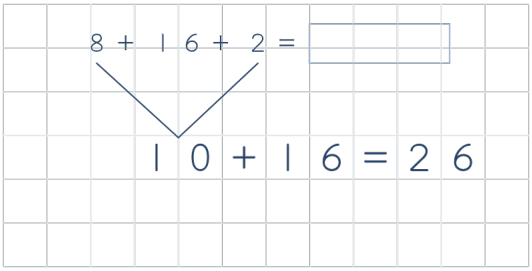
First, we add the chosen pair. 8 + 2 = 10. We write 10 on the squares, in the middle below the two chosen numbers. We still need the remaining addend, 16.

Step 5



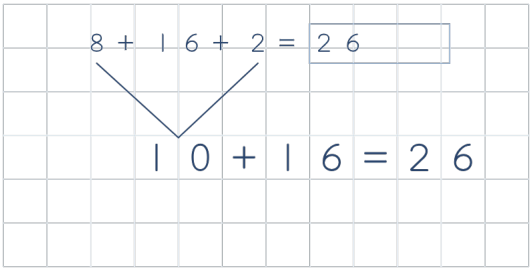
Next, we add the remaining addend to our first result. 10 + 16 = 26. There are no exchanges in this addition, so we can work it out mentally. We could use a column method if needed. We have now used all three original numbers once.

Step 6



Now, we check that we have used all three original addends once. First, 8 + 2 = 10. Then, 10 + 16 = 26. All three original numbers have been used once.

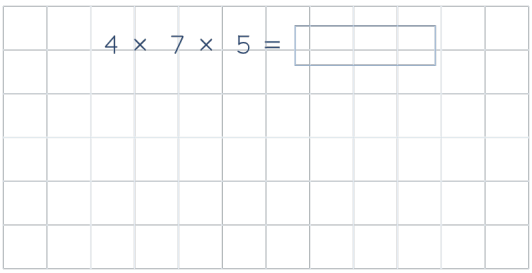
Step 7



The sum is 26. Copy 26 into the answer box. Make sure you copy the answer correctly.

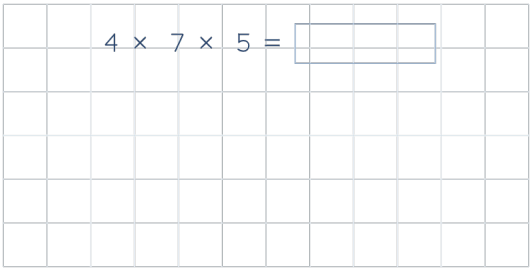
Year 5 - Multiplying 3 Numbers — Lesson Guide

Step 1



First, we circle both multiplication signs in the question. There are two multiplications, so we will calculate in two steps.

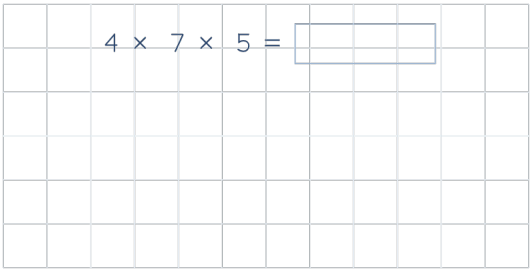
Step 2



Remember: Look at all three numbers. Use each original number once.

Multiplication is commutative, which means we can multiply the numbers in any order and get the same product. Let’s look for a pair that is easy to work out first.

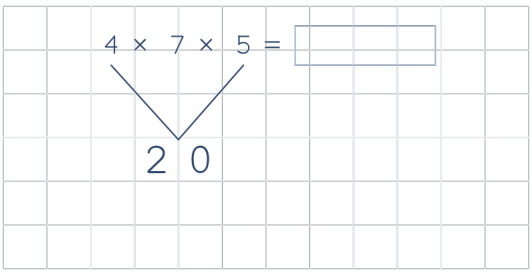
Step 3



Remember: Use each original number once.

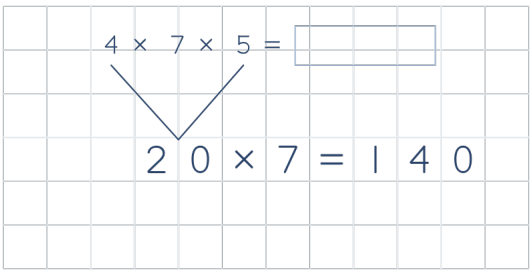
Use multiplication facts to choose a helpful pair. A useful pair here is 4 and 5. 4 × 5 = 20. 20 is 2 tens. We can use 2 × 7 to find the number of tens in the product. Draw a line from each chosen number to where we will write the first result. Keep 7 for the next step. Other pairs can still give the same product.

Step 4



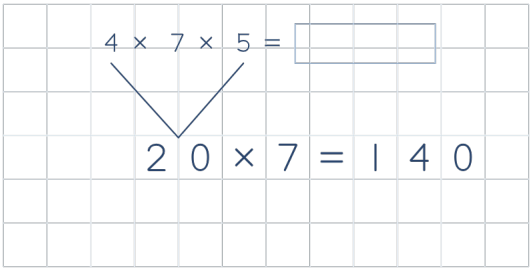
First, we multiply the chosen pair. 4 × 5 = 20. We write 20 on the squares, in the middle below the two chosen numbers. We still need the remaining factor, 7.

Step 5



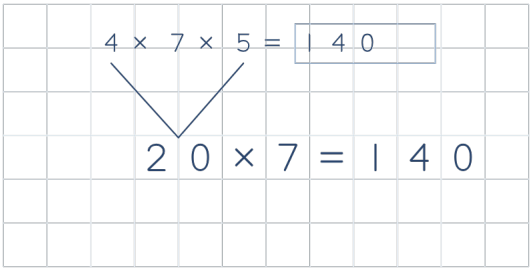
Next, we multiply our first result by the remaining factor. 20 is 2 tens. We know 2 × 7 = 14, so the product is 14 tens. 20 × 7 = 140. We can use our number facts mentally or choose a suitable written method if needed. We have now used all three original numbers once.

Step 6



Now, we check that we have used all three original factors once. First, 4 × 5 = 20. Then, 20 × 7 = 140. All three original numbers have been used once.

Step 7



The product is 140. Copy 140 into the answer box. Make sure you copy the answer correctly.

Year 5 - Adding Fractions with the Same Denominator — Lesson Guide

Step 1

$$\frac{2}{5} + \frac{4}{5} = \square$$

First, we circle the plus sign so we know to add the fractions and find their sum.

Step 2

$$\frac{2}{5} + \frac{4}{5} = \frac{\quad}{5}$$

Remember: The denominator stays the same because the size of each part stays the same.

Next, we check both denominators. Both are 5, so the parts are the same size. We tick both denominators to show they match. Then, we draw the fraction line and write 5 underneath it in the answer box.

Step 3

$$\frac{2}{5} + \frac{4}{5} = \frac{6}{5}$$

Remember: The denominator tells us the size of each part. Keep it the same when you add or subtract these parts.

Both fractions use fifths of the same whole. Add 4 fifths to 2 fifths to make 6 fifths. Write 6 above the fraction line.

Step 4

$\frac{2}{5} + \frac{4}{5} = \frac{6}{5}$

Now, we check all three denominators. The first denominator is 5. The second denominator is 5. Our answer denominator is 5. All three are the same. We also check that 2 + 4 = 6, our numerator.

Step 5

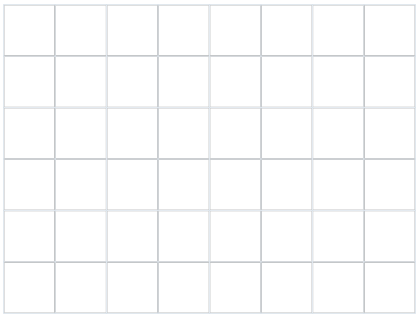
$\frac{2}{5} + \frac{4}{5} = 1\frac{1}{5}$

Read 6/5 as 6 fifths. 5 fifths make one whole. 1 fifth is left. Write 1 1/5 in the answer box.

Year 5 - Adding Fractions with Different Denominators — Lesson Guide

Step 1

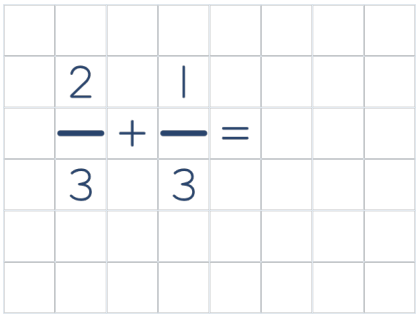
$\frac{2}{3} + \frac{2}{6} =$ ☐



First, we circle the plus sign so we know to add the fractions and find their sum.

Step 2

$\frac{2}{3} + \frac{2}{6} =$ ☐

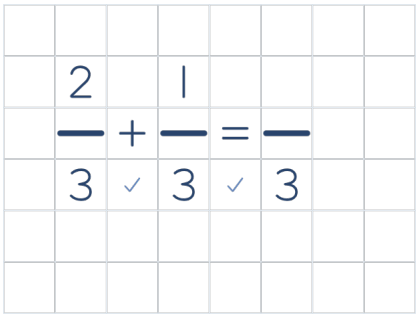


Remember: Change the numerator and denominator by the same factor to keep the value of the fraction.

First, we check whether either fraction can be simplified. One third is equivalent to two sixths. Divide the numerator and denominator by 2 to make that change. Both fractions now have denominator 3. We write 2/3 + 1/3 on the grid.

Step 3

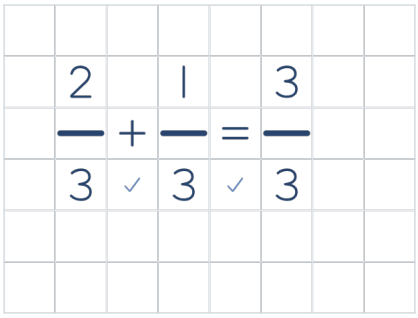
$\frac{2}{3} + \frac{2}{6} =$ ☐



Both denominators are 3, so the parts are the same size. We tick both denominators to show they match. Then, we draw the fraction line and write 3 underneath it.

Step 4

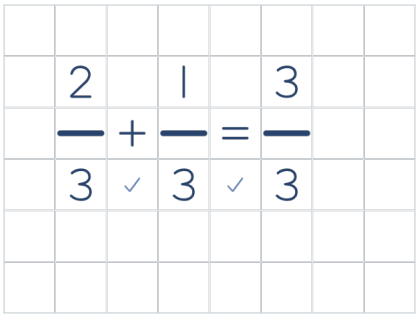
$\frac{2}{3} + \frac{2}{6} =$ ☐



Then, we add the numerators. 2 + 1 = 3. The denominator stays 3 because the parts are the same size. We write 3 above the fraction line.

Step 5

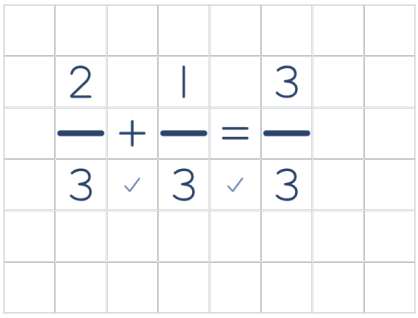
$\frac{2}{3} + \frac{2}{6} =$ ☐



The parts are the same size. Add 2 thirds and 1 third to make 3 thirds. Keep 3 as the denominator.

Step 6

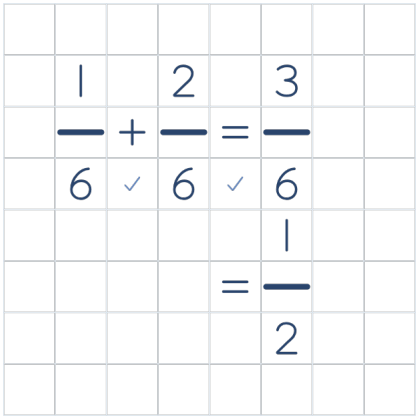
$\frac{2}{3} + \frac{2}{6} =$ **1**



3/3 is equal to 1. Copy 1 into the answer box.

Step 7

$\frac{1}{6} + \frac{1}{3} =$ $\frac{1}{2}$



The sum is 3/6. Divide its numerator and denominator by 3. 3/6 is equivalent to 1/2.

Year 5 - Subtracting Fractions with the Same Denominator — Lesson Guide

Step 1

$\frac{5}{6} - \frac{4}{6} =$ ☐

First, we circle the minus sign so we know to subtract the fractions and find their difference.

Step 2

$\frac{5}{6} - \frac{4}{6} =$ $\frac{\square}{6}$

Remember: The denominator stays the same because the size of each part stays the same.

Next, we check both denominators. Both are 6, so the parts are the same size. We tick both denominators to show they match. Then, we draw the fraction line and write 6 underneath it in the answer box.

Step 3

$\frac{5}{6} - \frac{4}{6} = \frac{1}{6}$

Remember: The denominator tells us the size of each part. Keep it the same when you add or subtract these parts.

Both fractions use sixths of the same whole. Take 4 sixths away from 5 sixths to leave 1 sixth. Write 1 above the fraction line.

Step 4

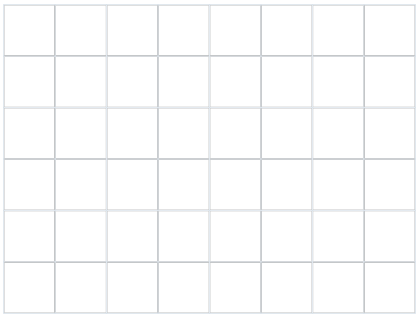
$\frac{5}{6} - \frac{4}{6} = \frac{1}{6}$

Now, we check all three denominators. The first denominator is 6. The second denominator is 6. Our answer denominator is 6. All three are the same. We also check that 5 – 4 = 1, our numerator.

Year 5 - Subtracting Fractions with Different Denominators — Lesson Guide

Step 1

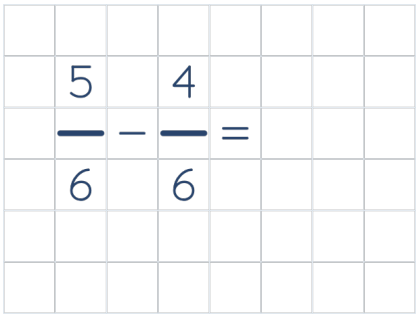
$\frac{5}{6} - \frac{2}{3} =$ ☐



First, we circle the minus sign so we know to subtract the fractions and find their difference.

Step 2

$\frac{5}{6} - \frac{2}{3} =$ ☐

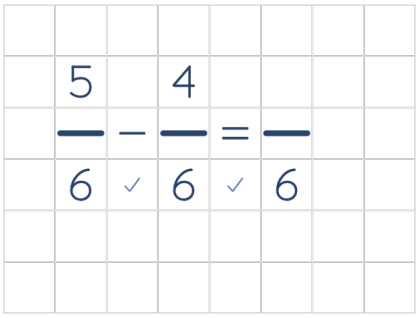


Remember: Change the numerator and denominator by the same factor to keep the value of the fraction.

First, we check whether either fraction can be simplified. Both fractions are already in their simplest form. 6 is a multiple of 3, so 6 is the smallest common denominator. To change 5/6 to denominator 3, we would also have to divide its numerator, 5, by 2. That would not give a whole number, so keep 6. Multiply the numerator and denominator of 2/3 by 2 to get 4/6. We write 5/6 – 4/6 on the grid.

Step 3

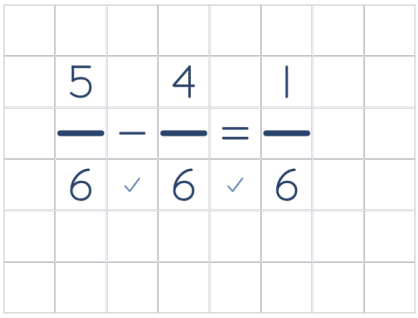
$\frac{5}{6} - \frac{2}{3} = \square$



Both denominators are 6, so the parts are the same size. We tick both denominators to show they match. Then, we draw the fraction line and write 6 underneath it.

Step 4

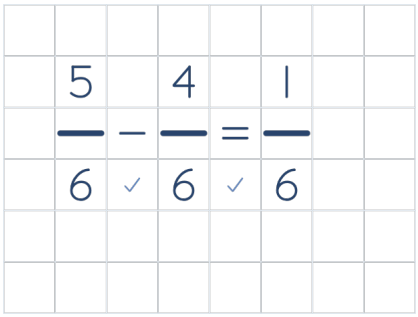
$\frac{5}{6} - \frac{2}{3} = \square$



Then, we subtract the numerators. 5 – 4 = 1. The denominator stays 6 because the parts are the same size. We write 1 above the fraction line.

Step 5

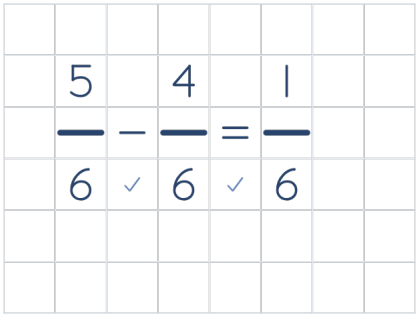
$\frac{5}{6} - \frac{2}{3} = \square$



The parts are the same size. Take 4 sixths away from 5 sixths to leave 1 sixth. Keep 6 as the denominator.

Step 6

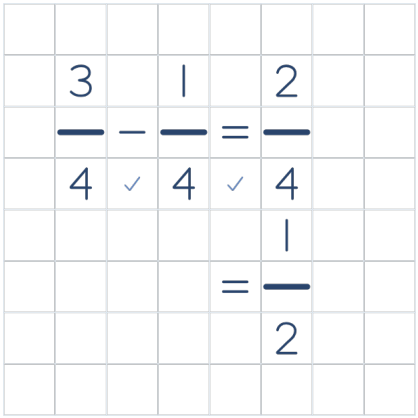
$\frac{5}{6} - \frac{2}{3} = \frac{1}{6}$



The difference is 1/6. Copy 1/6 into the answer box. Make sure you copy the answer correctly.

Step 7

$\frac{3}{4} - \frac{2}{8} = \frac{1}{2}$



The difference is 2/4. Divide its numerator and denominator by 2. 2/4 is equivalent to 1/2.

Year 5 - Rounding Whole Numbers — Lesson Guide

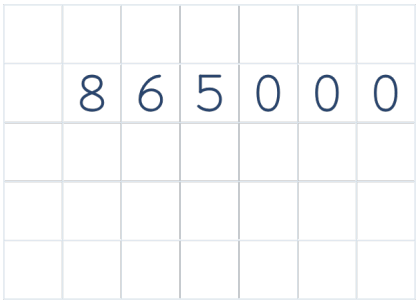
Step 1

865,000 to the nearest 100,000 = ☐

First, we read the question: 865,000 to the nearest 100,000. We underline 100,000 so we do not accidentally round to the wrong amount. As we are rounding to the nearest 100,000, our answer will be a multiple of 100,000, ending in at least five zeros.

Step 2

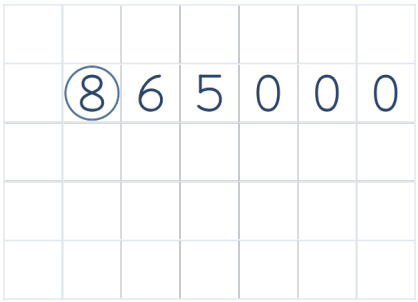
865,000 to the nearest 100,000 = ☐



Now, we write 865,000 in the correct columns, with one digit in each box. The first digit of 865,000, 8, is in the hundred thousands column, so we start there.

Step 3

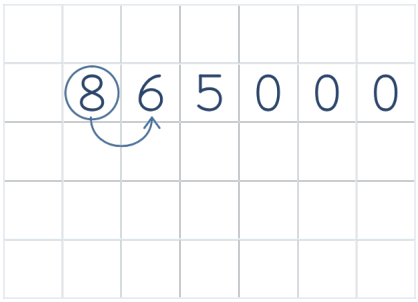
865,000 to the nearest 100,000 = ☐



Now, we circle the hundred thousands digit because we are rounding to the nearest 100,000.

Step 4

865,000 to the nearest 100,000 = ☐

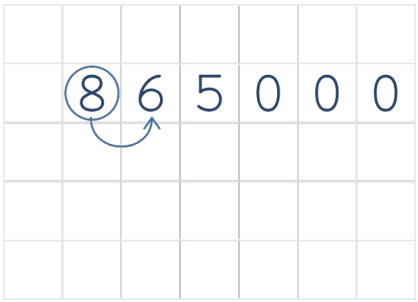


Remember: The circled digit marks the place to round to. The digit at the arrow tells us whether to round up.

The circled 8 marks the hundred thousands place. Draw a curved arrow from there to the 6 in the ten thousands place. That digit decides which way to round. Zero to four, stay on the floor. Five to nine, climb the vine.

Step 5

865,000 to the nearest 100,000 = ☐

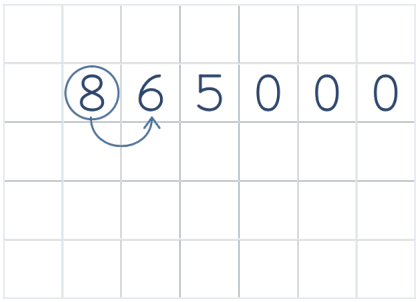


Remember: When we round down, the circled digit stays the same. When we round up, it increases by 1. If it reaches 10, write 0 and exchange into the next place.

6 is between 5 and 9, so we climb the vine and round up. We increase the hundred thousands place by one hundred thousand. All the digits to the right of the rounded place become 0.

Step 6

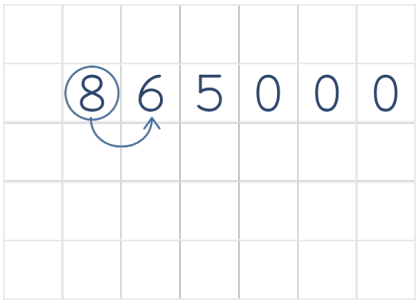
865,000 to the nearest 100,000 = 900000



Now, we write 900,000 directly in the answer box. 865,000 rounded to the nearest 100,000 is 900,000. Make sure you copy the answer correctly.

Step 7

865,000 to the nearest 100,000 = 900000

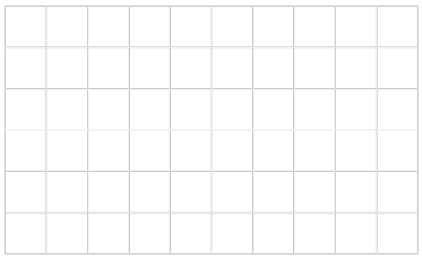


Check the rounding marks. The underline shows the nearest 100,000. The circle marks the 8 in the hundred thousands place. The arrow ends at the 6. The neighbouring multiples are 800,000 and 900,000. The halfway point is 850,000. 865,000 is closer to 900,000. That agrees with our rounded answer of 900,000.

Year 5 - Solving Calculations on Either Side — Lesson Guide

Step 1

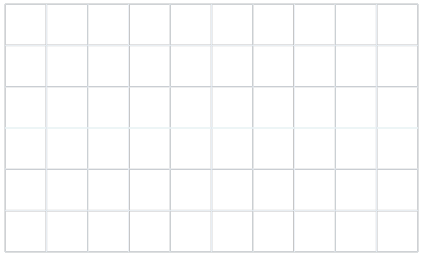
$\square \times 2 = 13 + 7$



First, we circle the operation sign on the left. Then, we circle the operation sign on the right. The equals sign tells us that both sides must have the same value.

Step 2

$\square \times 2 = \underline{13 + 7}$

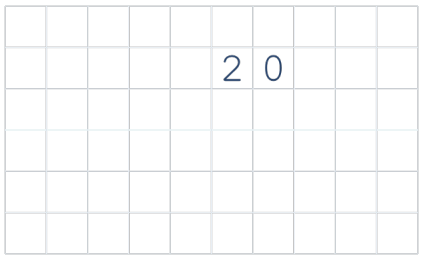


Remember: Both sides of the equals sign must have the same value.

Next, we look for the side with no missing number. We underline 13 + 7. We will work out this complete calculation first.

Step 3

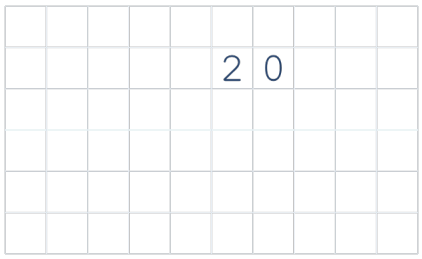
$\square \times 2 = \underline{13 + 7}$



I can use place value and a number fact to add 7 mentally. 13 + 7 = 20. We write 20 directly underneath this calculation, with one digit in each square.

Step 4

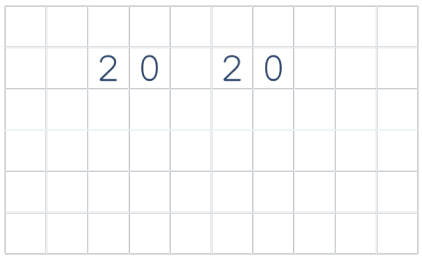
$\square \times 2 = 13 + 7$



The equals sign tells us that both sides have the same value. We underline something × 2 on the other side.

Step 5

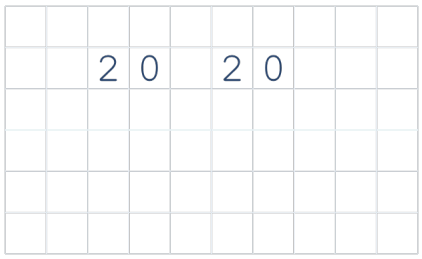
$\square \times 2 = 13 + 7$



The right side, 13 + 7, equals 20. The left side must also equal 20. Write 20 directly under the left side, with one digit in each square.

Step 6

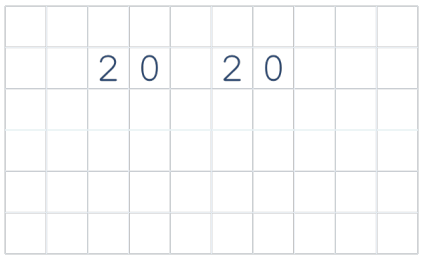
$\square \times 2 = 13 + 7$



Now we need something × 2 to equal 20. We can use our missing-number method to find the missing factor.

Step 7

☐ × 2 = 13 + 7

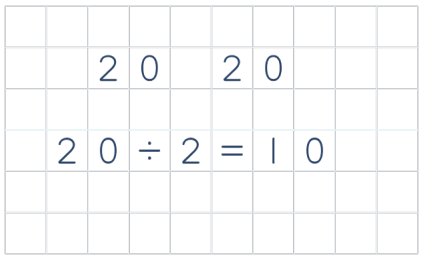


Remember: Work out the complete side first, wherever it appears. Use its value to find the missing number.

Look at the left side of the equals sign. It says something times 2. This side needs a value of 20. The box is for the missing factor.

Step 8

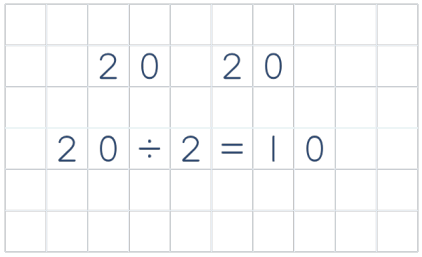
☐ × 2 = 13 + 7



The side with the blank must also equal 20. Divide 20 by 2 to find the missing factor. Write 20 ÷ 2 = 10 below the two totals.

Step 9

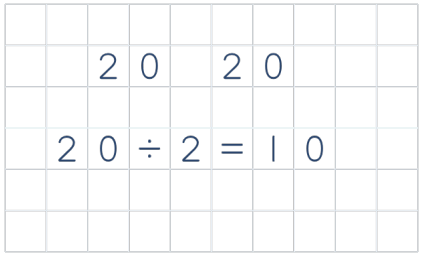
10 × 2 = 13 + 7



Now, we put 10 into the blank in the original question. Make sure you copy the answer correctly.

Step 10

10 × 2 = 13 + 7

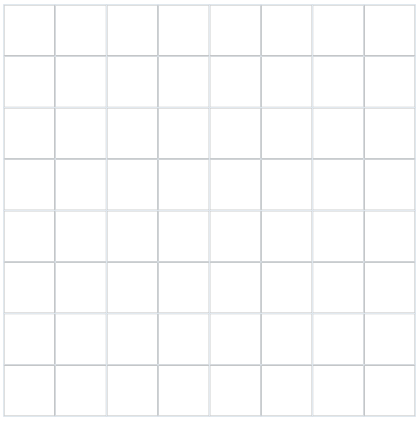


Read the completed equation. 10 × 2 = 13 + 7. The left side is 10 × 2, which makes 20. The right side is 13 + 7, which also makes 20. Both sides have the same value, so 10 works.

Year 5 - Multiplying a Mixed Number by a Whole Number — Lesson Guide

Step 1

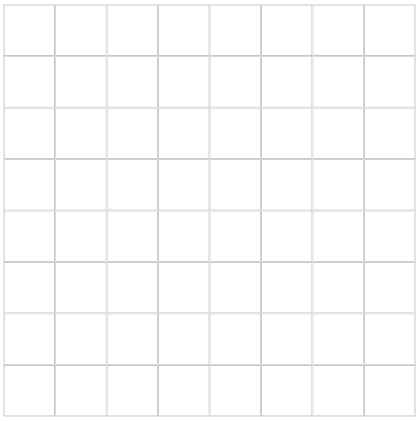
$2\frac{1}{2} \times 8 =$ ☐



First, we circle the multiplication sign so we know to multiply.

Step 2

$2\frac{1}{2} \times 8 =$ ☐

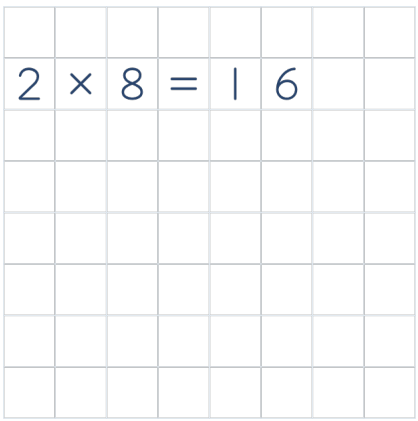


Remember: Multiply both the whole-number part and the fractional part. Add the two products.

We split 2 1/2 into its whole-number part, 2, and its fractional part, 1/2. Multiplying the whole amount by 8 means multiplying both parts by 8, then adding the two products.

Step 3

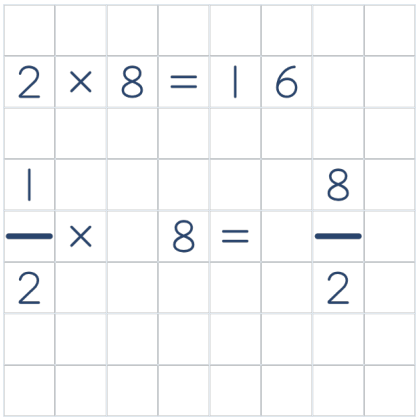
$2\frac{1}{2} \times 8 =$ ☐



First, we multiply the whole-number part. 2 × 8 = 16.

Step 4

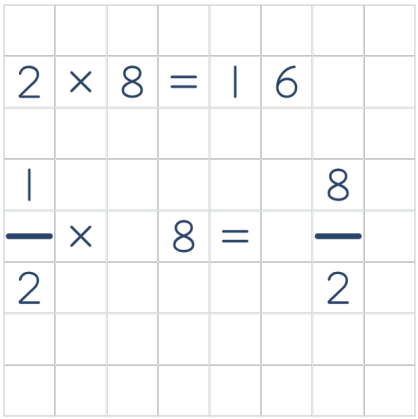
$2\frac{1}{2} \times 8 =$ ☐



Find 8 lots of 1 half. 1 × 8 = 8, so write 8 above the fraction line. Keep 2 as the denominator. The parts are still halves.

Step 5

$2\frac{1}{2} \times 8 =$ ☐

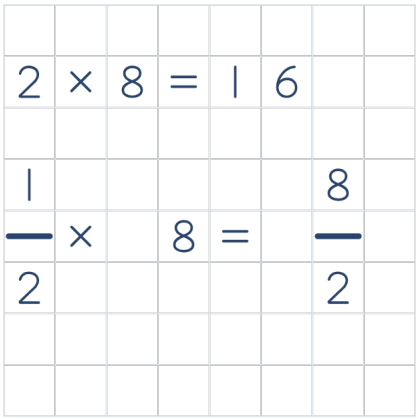


Remember: Count the wholes in 8 halves before adding the two products.

Read 8/2 as 8 halves. 2 halves make one whole, so 8 halves make 4 wholes. Add the fractional product to 16. Write 20 as the product.

Step 6

$2\frac{1}{2} \times 8 =$ **20**



The product is 20. Copy 20 into the answer box. Make sure you copy the answer correctly.

Year 5 - Bridge Through a Multiple of 10

When to choose this strategy

When adding takes us past a multiple of 10, add enough to reach it first. Then add the rest.

Worked example

9,600 + 800



1. We can add 400 to reach 10,000 from 9,600. Split 800 into 400 and 400. Start at 9,600 and add 400 to reach 10,000.

2. Add the remaining 400 to get 10,400. Check that 400 and 400 make the original 800.

> **Remember:** The first jump uses part of the number you are adding. Add only the part that is left.

Check understanding

58,600 + 3,000
Which multiple of 10 will you reach first? How much of the number is left to add?

Expected answer 58,600 + 3,000 = 61600

Year 5 - Bridge Through a Multiple of 10

When to choose this strategy

When subtracting takes us past a multiple of 10, subtract enough to reach it first. Then subtract the rest.

Worked example

10,300 − 700

10, 000 − 400 = 9, 600

1. We can subtract 300 to reach 10,000 from 10,300. Split 700 into 300 and 400. Start at 10,300 and subtract 300 to reach 10,000.

2. Subtract the remaining 400 to get 9,600. Check that 300 and 400 make the original 700.

> **Remember:** The first jump uses part of the number you are subtracting. Subtract only the part that is left.

Check understanding

61,300 − 3,000
Which multiple of 10 will you reach first? How much is left to subtract?

Expected answer 61,300 − 3,000 = 58300

Year 5 - Change an Addend When Close to a Clear Multiple

When to choose this strategy

When a number is close to a multiple of 10, 100 or 1,000, use the nearby multiple and then adjust.

Worked example

6,378 + 1,999



1. The addend, the number we add, is 1,999. It is close to 2,000, an easier number to work with. Add 2,000 to 6,378 to get 8,378.

2. We added 1 too much, so subtract 1. The sum is 8,377.

3. So 6,378 + 1,999 = 8,377. We used 2,000 and then adjusted by 1.

> **Remember:** If you added too much, subtract the extra. If you added too little, add the amount still needed.

Check understanding

2,476 + 998
What multiple will you add first? How will you adjust the total?

Expected answer 2,476 + 998 = 3474

Year 5 - Change the Subtrahend When Close to a Clear Multiple

When to choose this strategy

When a number is close to a multiple of 10, 100 or 1,000, use the nearby multiple and then adjust.

Worked example

6,378 − 1,999



1. The subtrahend, the number we subtract, is 1,999. It is close to 2,000, an easier number to work with. Subtract 2,000 from 6,378 to get 4,378.

2. We took away 1 too much, so add 1. The difference is 4,379.

3. So 6,378 − 1,999 = 4,379. We used 2,000 and then adjusted by 1.

> **Remember:** If you took away too much, add the extra back. If you took away too little, subtract the amount still needed.

Check understanding

2,476 − 998
What multiple will you subtract first? How much will you add back or still need to subtract?

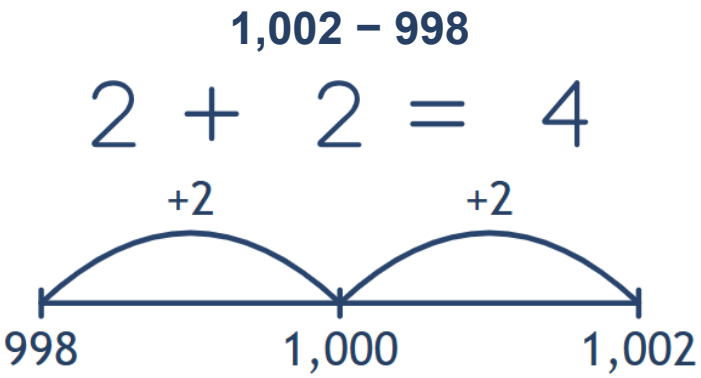
Expected answer 2,476 − 998 = 1478

Year 5 - Count Up to Find the Difference

When to choose this strategy

When the numbers are close, count up from the smaller one to find the gap. A nearby multiple of 10 can make the jumps easier.

Worked example



1. 1,002 and 998 are close together, so count up to find the difference. We count up from 998 to 1,000. That jump is 2.

2. Then we count up from 1,000 to 1,002. That jump is 2.

3. We add the jumps to find how far apart the numbers are. The difference is 4.

> **Remember:** The difference is the total of the jumps between the two numbers.

Check understanding

£8.00 − £6.49
Where will you start counting up? How do your jumps give the difference?

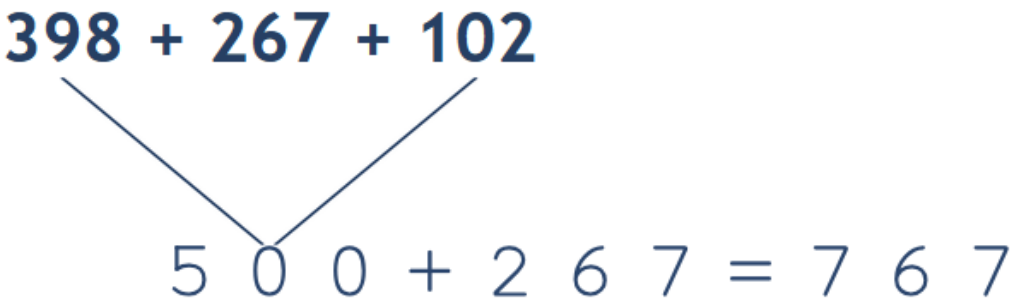
Expected answer £8.00 − £6.49 = 1.51

Year 5 - Choose a Pair to Add Three Numbers

When to choose this strategy

When adding three numbers, look at all three before choosing a pair. Use number bonds or doubles to make the next step easier. The useful pair can be anywhere in the question. Use the remaining number once after the first calculation.

Worked example



1. Choose 398 and 102 because 398 plus 102 makes 500, which is easy to add to. Keep 267 for the next step.

2. First, add 398 and 102 to get 500. Show the two numbers we chose and record their sum.

3. Next, 500 + 267 = 767. We have used all three original numbers once.

4. Now, we check using subtraction, the inverse. 767 − 267 − 102 = 398. We get back to the addend we started with.

> **Remember:** Use each of the three numbers once. After adding your pair, add the remaining number.

Check understanding

67 + 216 + 33
Which pair gives you a helpful total? What will you add to that total?

Expected answer 67 + 216 + 33 = 316

Year 5 - Use a Related Fact

When to choose this strategy

Use a known fact with hundreds or thousands. Keep the place value of the answer.

Worked example

7,000 + 6,000

7, 000 + 6, 000 = 13, 000

1. 7,000 is 7 thousands. 6,000 is 6 thousands. Use the known fact 7 + 6 = 13.

2. The result is 13 thousands, which is 13,000.

> **Remember:** Name the unit in the answer. For example, seven tens is seventy.

Check understanding

8,400 + 5,300
Which fact will you use? What place value does your answer have?

Expected answer 8,400 + 5,300 = 13700

Year 5 - Use a Related Fact

When to choose this strategy

Use a known fact with hundreds or thousands. Keep the place value of the answer.

Worked example

7,000 − 6,000



1. 7,000 is 7 thousands. 6,000 is 6 thousands. Use the known fact 7 − 6 = 1.

2. The result is 1 thousand, which is 1,000.

> **Remember:** Name the unit in the answer. For example, three tens is thirty.

Check understanding

8,400 − 5,300

Which subtraction fact helps? How do you turn that fact into the answer?

Expected answer 8,400 − 5,300 = 3100

Year 5 - Partition to Add Without Exchanges

When to choose this strategy

When the digits add without an exchange, partition the number you add. Add one part at a time.

Worked example

4,206 + 2,003



1. The matching digits in 4,206 and 2,003 add to less than 10 in each place, so we can add without exchanging. Partition 2,003 into 2,000 and 3. When we partition to work mentally, we start with the largest place value. Add 2,000 to 4,206 to get 6,206.

2. Then add 3 to 6,206. The sum is 6,209. Check that the two parts make 2,003.

> **Remember:** Add each part once. Start with the largest place value.

Check understanding

5,379 + 4,020
How will you partition the number you add? Which part will you add first?

Expected answer 5,379 + 4,020 = 9399

Year 5 - Partition to Subtract Without Exchanges

When to choose this strategy

When there is enough to subtract in each place, partition the number you subtract. Subtract one part at a time.

Worked example

62,430 − 2,400

$$60,430 - 400 = 60,030$$

1. In each place, the digit in 62,430 is large enough to subtract the matching digit in 2,400 without exchanging. Partition 2,400 into 2,000 and 400. When we partition to work mentally, we start with the largest place value. Subtract 2,000 from 62,430 to get 60,430.

2. Then subtract 400 from 60,430. The difference is 60,030. Check that the two parts make 2,400.

> **Remember:** Check that each place has enough to subtract. Start with the largest part when you partition the number you subtract.

Check understanding

6,910 − 3,100
How will you partition the number you subtract? Which part will you subtract first?

Expected answer 6,910 − 3,100 = 3810

Year 5 - Use a Near Double

When to choose this strategy

When the two numbers are one apart, double the smaller number and add 1.

Worked example

125 + 126



1. 126 is one more than 125. Start with double 125, which is 250.

2. Add the extra 1 from 126 to 250. The sum is 251.

> **Remember:** Add 1 to the double of the smaller number because the larger number is 1 more.

Check understanding

320 + 321
Which number will you double? Why will you add 1?

Expected answer 320 + 321 = 641

Year 5 - Use a Related Fact

When to choose this strategy

Use a multiplication or division fact with hundreds or thousands. Keep track of the unit you are counting.

Worked example

6,000 × 7



1. 6,000 is 6 thousands. Use the known fact 6 × 7 = 42.

2. The result is 42 thousands, which is 42,000.

> **Remember:** Keep the unit from the known fact. For example, twelve tens is one hundred and twenty.

Check understanding

900 × 8

Which multiplication fact will you use? What place value does the answer have?

Expected answer 900 × 8 = 7200

Year 5 - Use a Related Fact

When to choose this strategy

Use a multiplication or division fact with hundreds or thousands. Keep track of the unit you are counting.

Worked example

42,000 ÷ 7



1. 42,000 is 42 thousands. Use the known fact 42 ÷ 7 = 6.

2. The result is 6 thousands, which is 6,000.

> **Remember:** Keep track of what one group contains when you divide the tens or hundreds.

Check understanding

7,200 ÷ 8
Which place-value unit gives you a related division fact? What is one group worth?

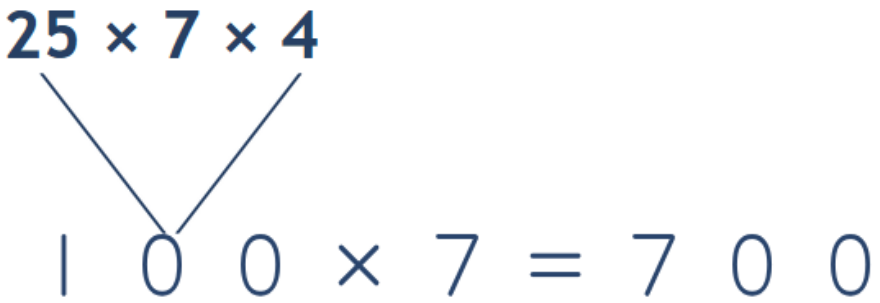
Expected answer 7,200 ÷ 8 = 900

Year 5 - Choose a Pair to Multiply Three Numbers

When to choose this strategy

When multiplying three numbers, look at all three before choosing a pair. Use multiplication facts to make the next step easier. The useful pair can be anywhere in the question. Use the remaining number once after the first calculation.

Worked example



1. Choose 25 and 4 because 25 times 4 makes 100, which is easy to multiply by. Keep 7 for the next step.

2. First, multiply 25 by 4 to get 100. Show the two numbers we chose and record their product.

3. Next, 100 is 1 hundred. We know 1 × 7 = 7, so the product is 7 hundreds. 100 × 7 = 700. We have used all three original numbers once.

4. Now, we check using division, the inverse. 700 ÷ 7 ÷ 4 = 25. We get back to the factor we started with.

> **Remember:** Multiply the product of your pair by the remaining factor.

Check understanding

4 × 13 × 25
Which pair gives a product that is easy to multiply by? Which factor will you use next?

Expected answer 4 × 13 × 25 = 1300

Year 5 - Double Twice

When to choose this strategy

To multiply by 4, double twice. This is helpful when both doubles are easy to find.

Worked example

23 × 4



1. Four is two times two, so we can double twice. Double 23 first to get 46.

2. Now double 46, the result of the first step, to get 92.

> **Remember:** Double the result of the first doubling.

Check understanding

32 × 4

What is the first double? Which number will you double next?

Expected answer 32 × 4 = 128

Year 5 - Halve Twice

When to choose this strategy

To divide by 4, halve twice. This is helpful when both halves are easy to find.

Worked example

84 ÷ 4

42 ÷ 2 = 21

1. Four is two times two, so we can halve twice. Halve 84 first to get 42.

2. Now halve 42, the result of the first step, to get 21. Check that four equal shares of 21 make 84.

> **Remember:** Halve the result of the first halving.

Check understanding

36 ÷ 4

What is the first half? Which number will you halve next?

Expected answer 36 ÷ 4 = 9

Year 5 - Use a Factor Pair

When to choose this strategy

Split one factor into two smaller factors when multiplying by them in turn is easier.

Worked example

18 × 6



1. 6 is 2 times 3. Double 18 first to get 36.

2. Then multiply 36 by 3. Multiplying by 2 and then by 3 is the same as multiplying by 6. The product is 108.

> **Remember:** The two smaller factors must multiply to make the original factor.

Check understanding

13 × 6

Which factor will you split? What will you multiply by first and then second?

Expected answer 13 × 6 = 78

Year 5 - Multiply by 5 Using 10

When to choose this strategy

Five is half of ten. Multiply by 10 and halve the product.

Worked example

48 × 5

480 ÷ 2 = 240

1. Five groups are half as many as ten groups. Multiply 48 by 10 first to get 480.

2. Now halve 480. Five groups of 48 make 240.

> **Remember:** Halve the product you get after multiplying by 10.

Check understanding

34 × 5

What will you get after multiplying by 10? Why do you halve that amount?

Expected answer 34 × 5 = 170

Year 5 - Close to a Multiple

When to choose this strategy

If one factor is close to a multiple of 10, use that multiple first. Then add or subtract the extra groups.

Worked example

39 × 7

$$280 - 7 = 273$$

1. 39 is close to 40. Use 40 groups of 7 first to get 280.

2. We counted one group of 7 too many. Subtract 7 to get 273.

> **Remember:** Each extra or missing group is worth the other factor.

Check understanding

19 × 6

Which multiple will you use? What is one group worth, and how will you use it to adjust?

Expected answer 19 × 6 = 114

Year 5 - Change the Minuend When Close to a Clear Multiple

When to choose this strategy

If the minuend, the starting number, is close to an easy multiple, start at the multiple and subtract the same number. Then correct the difference.

Worked example

398 − 175

225 − 2 = 223

1. The minuend, the number we start with, is 398. It is close to 400, an easier number to work with. Start at 400 and still subtract 175 to get 225.

2. We started with 2 too much, so subtract 2. The difference is 223.

> **Remember:** Keep the number you subtract the same. If you started too high, subtract the extra. If you started too low, add the difference back.

Check understanding

297 − 146
What easier number will you start from? How will you correct the difference?

Expected answer 297 − 146 = 151

Year 5 - Same Sum

When to choose this strategy

When one number is close to a multiple, move the same amount from one addend to the other. The sum stays the same.

Worked example

236 + 399

235 + 400 = 635

1. 399 is close to 400. Move that amount from one addend to the other to keep the same sum. Add 1 to 399. Then subtract 1 from 236.

2. Now add 400 to 235. The sum is 635.

> **Remember:** Add to one addend and subtract that exact amount from the other.

Check understanding

384 + 499
How much will you move, and from which addend to which?

Expected answer 384 + 499 = 883

Year 5 - Same Difference

When to choose this strategy

When one number is close to a multiple, add the same amount to both numbers or subtract it from both. The gap stays the same.

Worked example

403 − 198

405 − 200 = 205

1. 198 is close to 200. Change both numbers by the same amount in the same direction to keep the same difference. Add 2 to 198. Then add 2 to 403.

2. Now subtract 200 from 405. The difference is 205.

> **Remember:** Change both numbers by the same amount in the same direction.

Check understanding

384 − 299
What change will you make to both numbers? Why will the difference stay the same?

Expected answer 384 − 299 = 85

Year 5 - Make an Easier Multiplication

When to choose this strategy

Halve one factor and double the other when this makes an easier multiplication. To multiply by 25, try dividing the other factor by 4 and multiplying by 100.

Worked example

16 × 35



1. We can turn 35 into 70, which is easier to multiply by. Halve 16 and double 35. Changing the factors in opposite directions by the same scale factor keeps the product the same.

2. Multiply 8 by 70. The product is 560.

> **Remember:** Multiply one factor by the scale factor and divide the other by it.

Check understanding

48 × 25

How could you make one factor easier? What matching change will you make to the other factor?

Expected answer 48 × 25 = 1200

Year 5 - Make an Easier Division

When to choose this strategy

Multiply or divide both numbers by the same amount to make an easier division. For division by 5, double both numbers and divide by 10.

Worked example

96 ÷ 16



1. We can change the divisor from 16 to 8, which is easier to divide by. Divide both numbers by 2. The quotient stays the same because both numbers change by the same scale factor.

2. Divide 48 by 8. The quotient is 6.

> **Remember:** Multiply both numbers by the same factor, or divide both by the same factor.

Check understanding

168 ÷ 12
How could you change both numbers to give yourself an easier divisor?

Expected answer 168 ÷ 12 = 14

Year 5 - Change an Addend When Close to a Whole Number (Decimals)

When to choose this strategy

If a number is close to a whole number, add the whole number first. Then correct the answer.

Worked example

8.6 + 2.99



1. The addend, the number we add, is 2.99. It is close to 3, an easier number to work with. Add 3 to 8.6 to get 11.6.

2. We added 0.01 too much, so subtract 0.01. The sum is 11.59.

> **Remember:** Keep the adjustment in the right place value. An extra two hundredths is 0.02.

Check understanding

11.18 + 3.98
Which whole number will you add first? What decimal amount will you adjust by?

Expected answer 11.18 + 3.98 = 15.16

Year 5 - Change the Subtrahend When Close to a Whole Number (Decimals)

When to choose this strategy

If the number you subtract is close to a whole number, subtract the whole number first. Then correct the answer.

Worked example

8.6 − 2.99



1. The subtrahend, the number we subtract, is 2.99. It is close to 3, an easier number to work with. Subtract 3 from 8.6 to get 5.6.

2. We took away 0.01 too much, so add 0.01. The difference is 5.61.

> **Remember:** If you took away too much, add back the difference between the two amounts. Keep track of tenths and hundredths.

Check understanding

11.18 − 3.98
What whole number will you subtract first? What decimal amount will you adjust by?

Expected answer 11.18 − 3.98 = 7.2

Year 5 - Choose a Pair to Make 1

When to choose this strategy

When two decimals add to 1, add that pair first. Then add the third number.

Worked example

0.46 + 0.27 + 0.54

1 + 0.27 = 1.27

1. 0.46 is 46 hundredths and 0.54 is 54 hundredths. They make 100 hundredths, or 1 whole. Add that pair first.

2. Add the remaining 0.27 to 1. The sum is 1.27. Check that you used all three original numbers once.

> **Remember:** One whole is ten tenths or one hundred hundredths. Use the same unit when you look for the pair.

Check understanding

0.73 + 0.16 + 0.27
Which two decimals make one whole? What do you still need to add?

Expected answer 0.73 + 0.16 + 0.27 = 1.16