Mathematics Level 3

Chapter 1 — Number: whole numbers and the four operations

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Contents

Odd and even numbers

Code: VC2M3N01 (.E01, .E02, .E03, .E04, .E05)

Every whole number is either **even** or **odd**. In this topic you will find out what even and odd mean, use a flow chart to sort numbers, share counters between 2 friends, and use odd and even rules to check your adding, subtracting and multiplying.

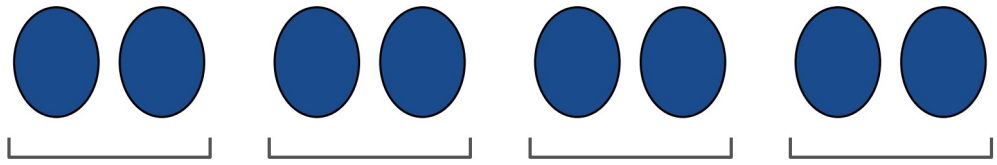
You will need: counters, grid paper and a pencil.

Learn about odd and even numbers

1. Even means everything has a partner

A **pair** is 2 counters together.

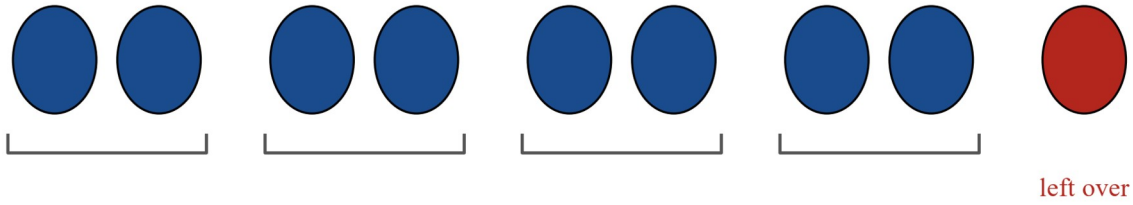
8 is even: 4 pairs, nothing left over



Eight blue counters grouped into four pairs. Nothing is left over.

8 counters make 4 pairs. Nothing is left over, so **8 is even**.

9 is odd: 4 pairs and 1 left over



Nine counters grouped into four pairs, with one red counter left over on its own.

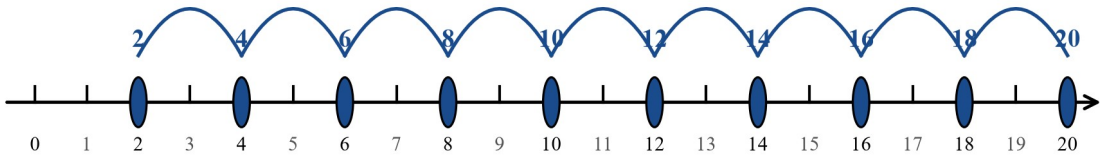
9 counters make 4 pairs, but 1 counter has no partner. It is left over, so **9 is odd**.

Even numbers split into pairs with nothing left over. **Odd** numbers have 1 left over.

2. Skip counting by 2s finds the even numbers

Count on by 2s from 2: 2, 4, 6, 8, 10, and so on. The numbers you say are the even numbers.

Skip counting by 2s: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20



A number line from 0 to 20 with blue dots and hops on 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20.

The odd numbers sit in between: 1, 3, 5, 7, 9, and so on.

As you count, the numbers take turns: odd, even, odd, even. Every even number has an odd number before it and an odd number after it.

3. The last number tells you

You do not have to pair up a big number. Just look at the number it ends with — the last number.

- If a number ends with 0, 2, 4, 6 or 8, it is **even**.
- If a number ends with 1, 3, 5, 7 or 9, it is **odd**.

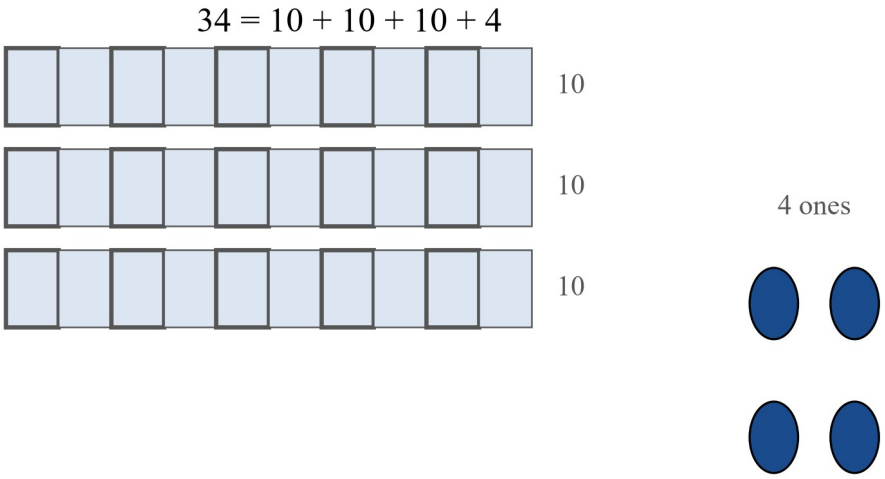
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The even numbers make stripes down the chart

A chart of the numbers from 1 to 100. The even numbers are shaded and make stripes going down the chart.

On a 100 chart, the even numbers make stripes going down the chart. Every number in a stripe ends with 0, 2, 4, 6 or 8.

Why does the last number tell you? Every group of 10 splits into 5 pairs. So the tens and the hundreds are in pairs too. Only the ones at the end are left to check.



Every 10 splits into 5 pairs. The 4 ones make 2 pairs. Nothing is left over, so 34 is even.

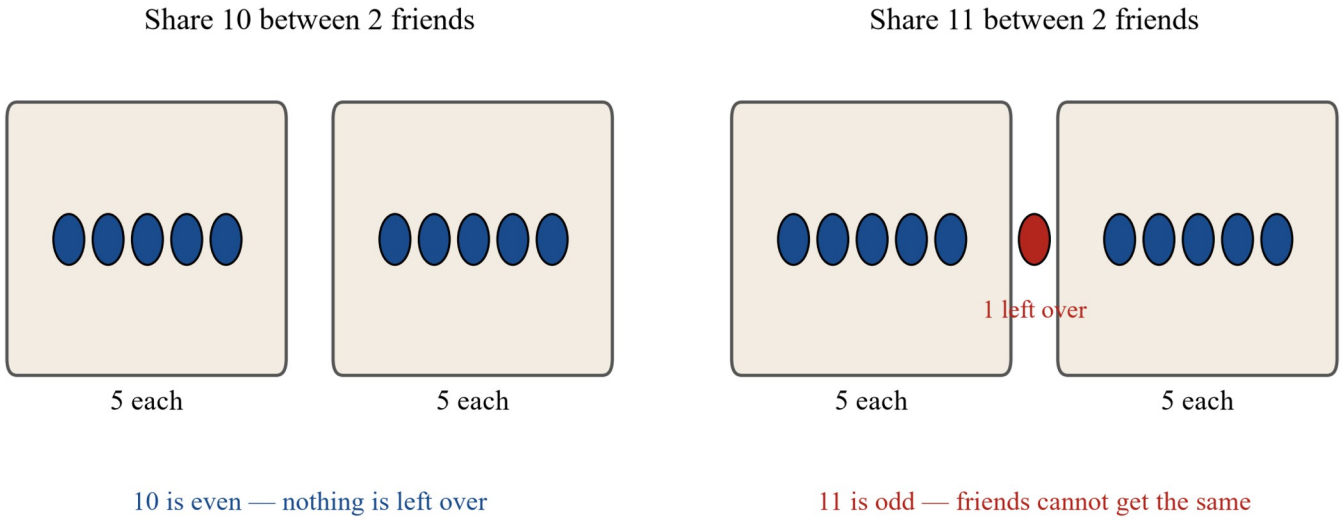
Three rows of ten squares, each row split into five pairs, next to four blue counters. The words show 34 = 10 + 10 + 10 + 4.

34 is 3 tens and 4 ones. The 3 tens all split into pairs, and the 4 ones make 2 pairs, so 34 is even.

37 ends with 7. The 7 ones make 3 pairs with 1 left over, so 37 is odd.

4. Sharing between 2 friends

Odd and even also tell you about sharing between 2.



Two pictures of counters shared between two plates. Left: ten counters, five on each plate and nothing left over. Right: eleven counters, five on each plate and one red counter left over.

10 counters shared between 2 friends is 5 each. Nothing is left over, because 10 is even.

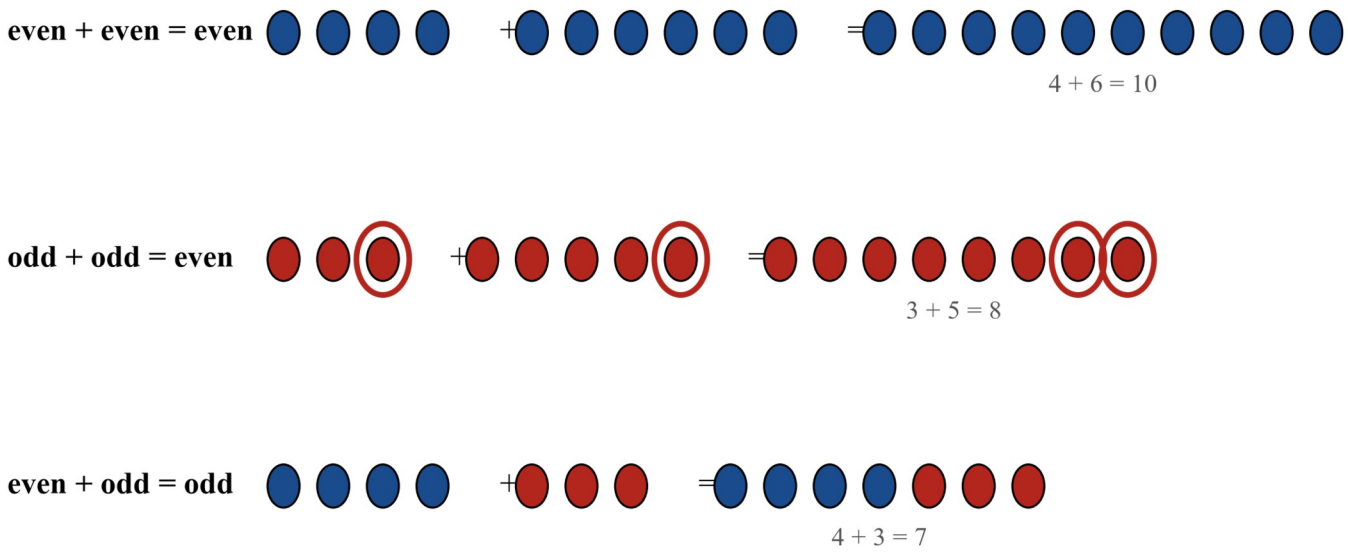
11 counters shared between 2 friends is 5 each, with 1 left over. You cannot give both friends the same number, because 11 is odd.

> **Even** numbers can be shared between 2 people so both get the same. **Odd** numbers cannot — there is always 1 left over.

5. Adding odd and even numbers

When you add odd and even numbers, the answers follow rules.

Add	Rule	Try one
even + even	even	4 + 6 = 10
odd + odd	even	3 + 5 = 8
even + odd	odd	4 + 3 = 7



Three rows of dots. The first row shows 4 dots plus 6 dots making 10 dots. The second row shows 3 dots plus 5 dots making 8 dots, with a circle around the two left-over dots that pair up. The third row shows 4 dots plus 3 dots making 7 dots.

Why does odd + odd come out even? Each odd number has 1 counter with no partner. When you put two odd numbers together, the two left-over counters pair up with each other. Now everything has a partner, so the answer is even.

6. Subtracting and multiplying

The rules work for subtracting too.

Subtract	Rule	Try one
even − even	even	8 − 6 = 2
odd − odd	even	7 − 3 = 4
odd − even	odd	7 − 4 = 3
even − odd	odd	8 − 3 = 5

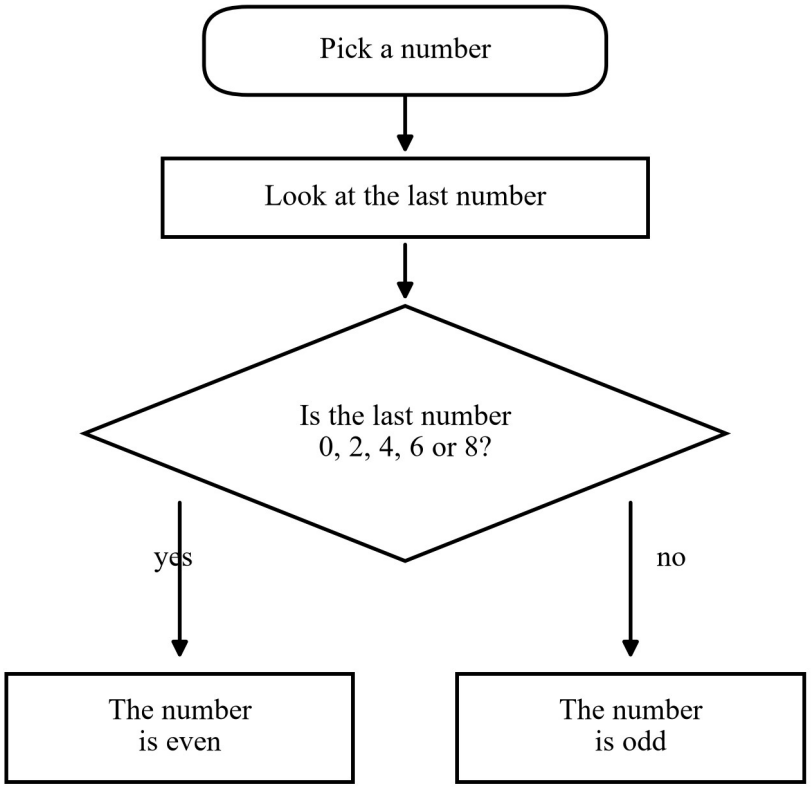
For multiplying, look at the two numbers you start with.

- If one of the numbers is even, the answer is even. 3 × 4 = 12, and the groups of 4 all split into pairs.
- Odd × odd = odd. 3 × 5 = 15.

You can use all of these rules to check your work. If two odd numbers add up to an odd answer, something went wrong.

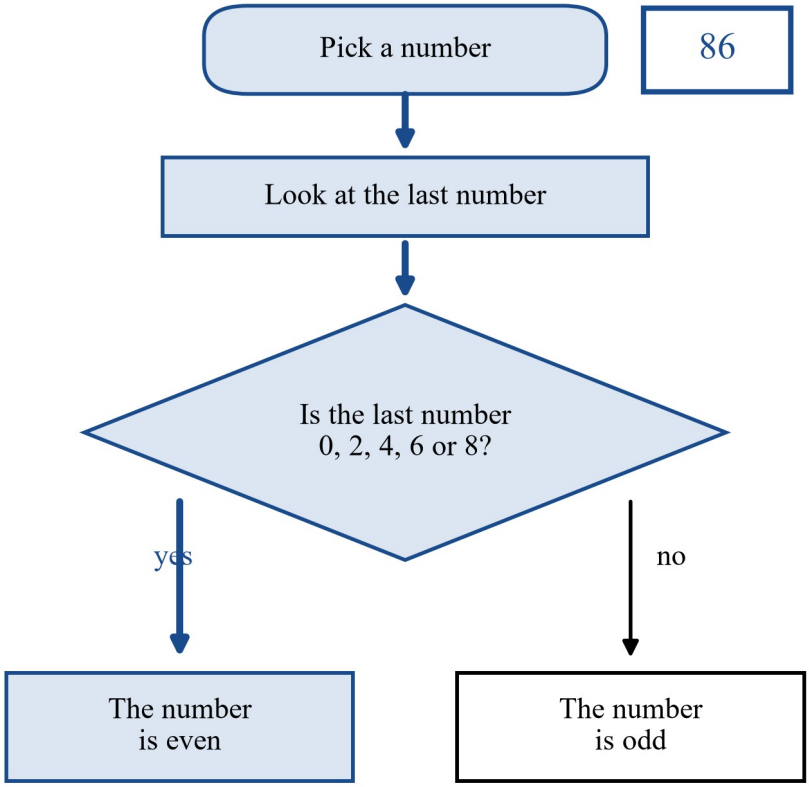
7. Follow the flow chart

A **flow chart** is a set of steps to follow, shown as a picture with boxes and arrows. This flow chart sorts any number into odd or even.



A flow chart with three steps. Pick a number, look at the last number, then answer the question: is the last number 0, 2, 4, 6 or 8? Yes means the number is even. No means the number is odd.

Let us try 86.



86 ends in 6. 6 is one of 0, 2, 4, 6, 8, so 86 is even.

The same flow chart with the path for 86 in blue. 86 ends in 6, and 6 is one of 0, 2, 4, 6 or 8, so 86 is even.

- Start with 86.
- Look at the last number. It is 6.
- Is 6 one of 0, 2, 4, 6, 8? Yes.
- So 86 is **even**.

Even numbers can be shared by 2 with nothing left over. The flow chart also picks out all the numbers that can be shared by 2 with nothing left over.

Worked examples

Example 1 — with help

Is 47 odd or even? How do you know?

Working	What we did
The last number in 47 is 7.	Looked at the number it ends with.
7 is not 0, 2, 4, 6 or 8.	Checked the flow chart rule.
47 is odd. ✓	Gave the answer.

Check with counters: 47 counters make 23 pairs with 1 left over. 47 is odd. ✓

Example 2 — with help

Ben has 13 muffins. He wants to share them between 2 friends so both get the same. Can he?

Working	What we did
13 ends with 3, so 13 is odd.	Used the last-number rule.
Each friend gets 6 muffins.	6 + 6 = 12.
1 muffin is left over.	13 − 12 = 1.
No — they cannot get the same. ✓	Odd numbers leave 1 over.

Example 3 — on your own

Zoe says 25 + 17 = 41. Without adding, use the odd and even rules to check her answer.

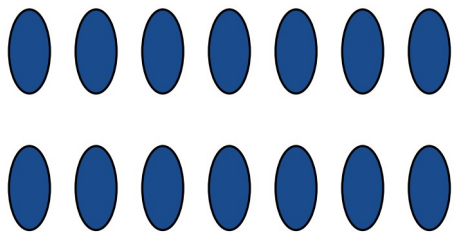
25 is odd and 17 is odd. Odd + odd = even, so the answer must be even.

41 is odd, so Zoe's answer cannot be right. (25 + 17 = 42, and 42 is even. ✓)

Practice questions

With help

Q1. Pair up the dots. Is the number of dots even or odd? How do you know?



Fourteen blue dots in two rows of seven.

Q2. Count on by 2s. Fill in the missing numbers: 2, 4, **, 8,** , 12

Q3. Circle the even numbers: 6, 11, 18, 25, 30, 43

Q4. Look at the last number. Write odd or even. (a) 34 (b) 57 (c) 90 (d) 61 (e) 28

Q5. 12 apples are shared between 2 friends. How many apples does each friend get? Is anything left over?

Q6. Fill in even or odd. (a) even + even = __ (b) even + odd = __ (c) odd + odd = __

Q7. Use the flow chart to test 64. What is the last number? Is 64 odd or even?

Q8. This is part of a 100 chart. Shade every number that ends with 6. Are the numbers you shaded odd or even?

51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Shade every number that ends in 6

A chart of the numbers from 51 to 100, in five rows of ten.

On your own

Q9. Write odd or even. (a) 83 (b) 106 (c) 275 (d) 994 (e) 1 000 (f) 12 347

Q10. Write 3 even numbers between 40 and 50. Write 3 odd numbers between 40 and 50.

Q11. Mia has 15 stickers. She shares them between 2 friends so both get the same. How many stickers does each friend get? How many are left over?

Q12. Fill in the missing numbers: 46, 48, **,** , 54

Q13. Without adding, say if each answer is odd or even. (a) 33 + 21 (b) 58 + 14 (c) 27 + 46

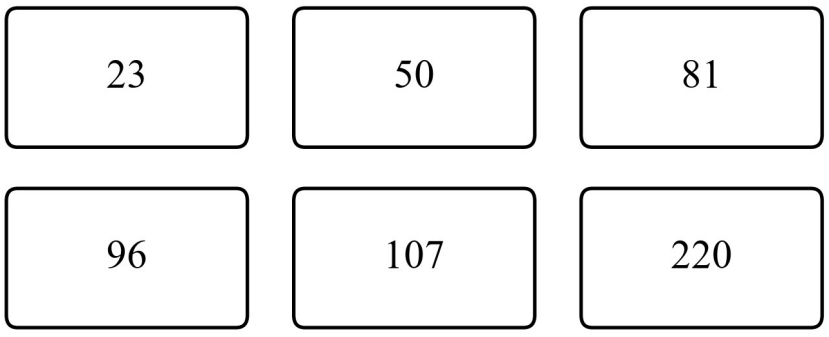
Q14. True or false: odd + odd = odd. Use counters or dots to show why your answer is right.

Q15. Without subtracting, say if each answer is odd or even. (a) 72 − 30 (b) 45 − 21 (c) 39 − 14

Q16. (a) Is 6 × 3 odd or even? (b) Is 5 × 7 odd or even? (c) Finish the rule: if one of the numbers is even, the answer is __.

Q17. Solve the riddle. I am between 70 and 80. I am even. My last number is 6. What number am I?

Q18. Use the flow chart to sort these numbers into odd and even.

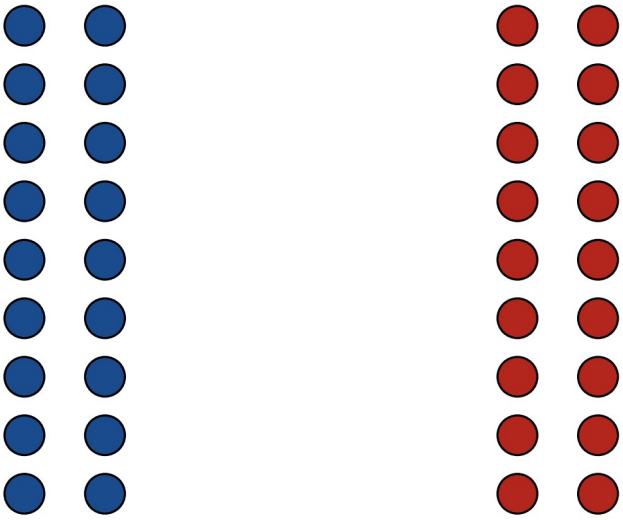


Six number cards: 23, 50, 81, 96, 107 and 220.

Q19. Australian rules football is played between two teams. Each team has 18 players on the ground.

Source: Wikipedia, *Australian rules football*, read 2026-08-20.

Two teams of 18 players on the ground



18 players 18 players

Two teams of 18 players on the ground, shown as dots: 18 blue dots in nine rows of two, and 18 red dots in nine rows of two.

(a) Is 18 odd or even? How do you know?

(b) How many players are on the ground in all?

(c) Explain why the total must be even, without adding 18 + 18.

Answers

Q1. 7 pairs, nothing left over; even. **Q2.** 6 and 10. **Q3.** 6, 18 and 30. **Q4.** (a) even (b) odd (c) even (d) odd (e) even. **Q5.** 6 each; nothing left over. **Q6.** (a) even (b) odd (c) even. **Q7.** The last number is 4; even. **Q8.** 56, 66, 76, 86 and 96; all even. **Q9.** (a) odd (b) even (c) odd (d) even (e) even (f) odd. **Q10.** Any 3 of 42, 44, 46, 48; any 3 of 41, 43, 45, 47, 49. **Q11.** 7 each, 1 left over. **Q12.** 50 and 52. **Q13.** (a) even (b) even (c) odd. **Q14.** False; 3 + 5 = 8, and 8 is even. **Q15.** (a) even (b) even (c) odd. **Q16.** (a) even (b) odd (c) even. **Q17.** 76. **Q18.** Odd: 23, 81, 107. Even: 50, 96, 220. **Q19.** (a) even (b) 36 (c) even + even = even.

Worked answers

Q1. 14 dots make 7 pairs with nothing left over, so 14 is even.

Q2. Counting on by 2s: 2, 4, 6, 8, 10, 12. The missing numbers are 6 and 10.

Q3. 6, 18 and 30 end with 0, 2, 4, 6 or 8, so they are even. 11, 25 and 43 are odd.

Q4. (a) 34 ends with 4, even. (b) 57 ends with 7, odd. (c) 90 ends with 0, even. (d) 61 ends with 1, odd. (e) 28 ends with 8, even.

Q5. 12 shared between 2 friends is 6 each. Nothing is left over, because 12 is even.

Q6. (a) even + even = even. (b) even + odd = odd. (c) odd + odd = even.

Q7. The last number in 64 is 4. 4 is one of 0, 2, 4, 6, 8, so 64 is even.

Q8. The numbers that end with 6 are 56, 66, 76, 86 and 96. They all end with 6, so they are all even.

Q9. (a) 83 ends with 3, odd. (b) 106 ends with 6, even. (c) 275 ends with 5, odd. (d) 994 ends with 4, even. (e) 1 000 ends with 0, even. (f) 12 347 ends with 7, odd.

Q10. Even numbers between 40 and 50: 42, 44, 46, 48 (pick any 3). Odd numbers: 41, 43, 45, 47, 49 (pick any 3).

Q11. 15 is odd, so 1 sticker is left over. Each friend gets 7 stickers, because 7 + 7 = 14 and 14 + 1 = 15.

Q12. Counting on by 2s: 46, 48, 50, 52, 54. The missing numbers are 50 and 52.

Q13. (a) 33 and 21 are both odd; odd + odd = even, so 33 + 21 is even. (b) 58 and 14 are both even; even + even = even. (c) 27 is odd and 46 is even; even + odd = odd.

Q14. False. Try 3 counters and 5 counters: the two left-over counters pair up, so 3 + 5 = 8, which is even. Odd + odd is always even.

Q15. (a) even − even = even, so 72 − 30 is even. (b) odd − odd = even, so 45 − 21 is even. (c) odd − even = odd, so 39 − 14 is odd.

Q16. (a) 6 × 3 = 18, even: the groups of 6 all split into pairs. (b) 5 × 7 = 35, odd: odd × odd = odd. (c) If one of the numbers is even, the answer is even.

Q17. The number is between 70 and 80, even, and ends with 6: it is 76.

Q18. Run each card through the flow chart. Odd: 23 (ends with 3), 81 (ends with 1), 107 (ends with 7). Even: 50 (ends with 0), 96 (ends with 6), 220 (ends with 0).

Q19. (a) 18 ends with 8, so 18 is even. (b) 18 + 18 = 36 players. (c) 18 is even, and even + even = even, so the total must be even before you add.

Reading, writing and ordering numbers beyond 10 000

Code: VC2M3N02 (.E01, .E02, .E03, .E04)

> *recognise, represent and order natural numbers using naming and writing conventions for numerals beyond 10 000* — VC2M3N02

In Year 2 you read, wrote and ordered numbers to 1000. Now you will go beyond 10 000. You will read big numbers, write them with a **space** between groups of three digits, and put them in order.

You will need: a place-value chart, base-ten blocks, number cards and a pencil.

Learn about numbers beyond 10 000

1. The place pattern repeats

Ten ones make one ten. Ten tens make one hundred. Ten hundreds make one thousand. And the pattern goes on: ten of any place make one of the next place.

The place names repeat too: ones, tens, hundreds, then ones of thousands, tens of thousands, hundreds of thousands.

Here is 42 367 in a place-value chart. The space in the middle of the chart splits the thousands part from the ones part.

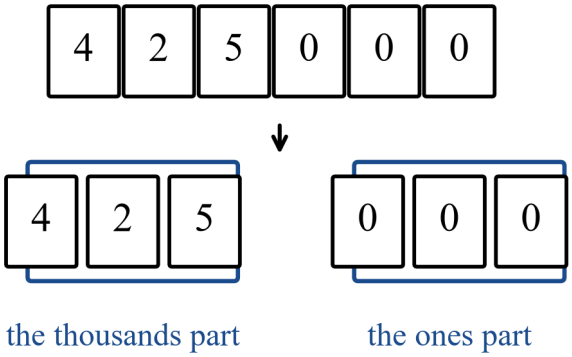
hundreds of thousands	tens of thousands	ones of thousands	hundreds	tens	ones
	4	2	3	6	7
	40 000	2 000	300	60	7

A place-value chart showing the number 42 367 and what the digits are worth.

Read the chart: 4 tens of thousands, 2 thousands, 3 hundreds, 6 tens and 7 ones. The bottom row shows what the digits are worth: 40 000 + 2 000 + 300 + 60 + 7.

2. Write big numbers with a space

When a number has more than four digits, group the digits in sets of three, counting from the right. Leave a space between the sets. The last set is the ones part. The next set is the thousands part.



425 000

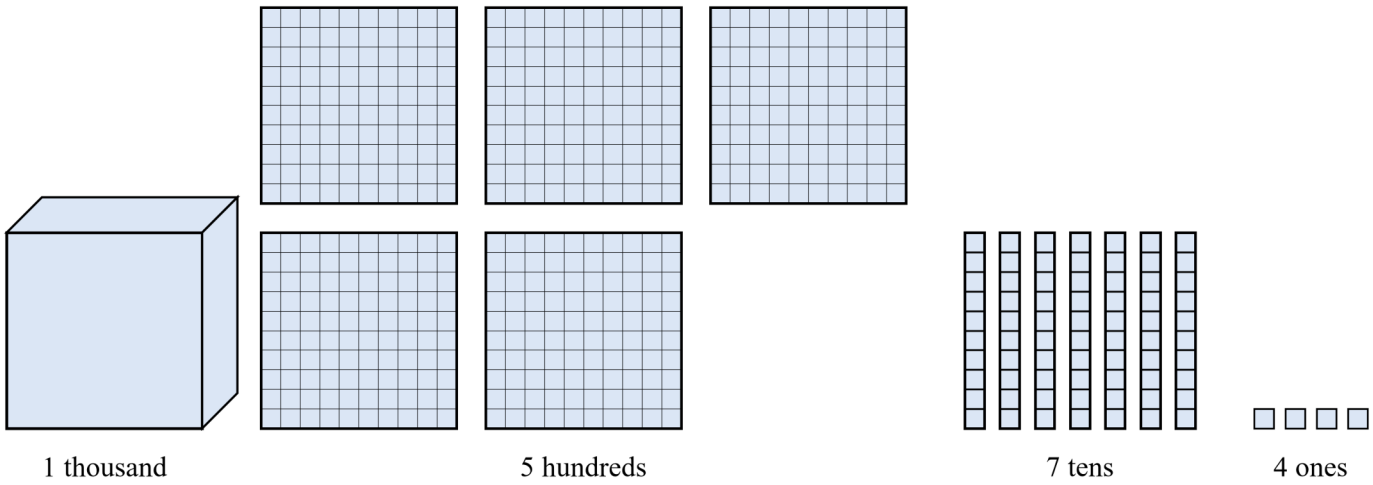
Number cards 4, 2, 5, 0, 0, 0 grouped in two sets of three, written as 425 000.

425 000 is *four hundred and twenty-five thousand*. Read the thousands part first — 425, *four hundred and twenty-five* — then say *thousand*, then read the ones part — 000, *nothing more*.

In this book we always write big numbers with a space, never with a comma: 10 000, 425 000, 99 999.

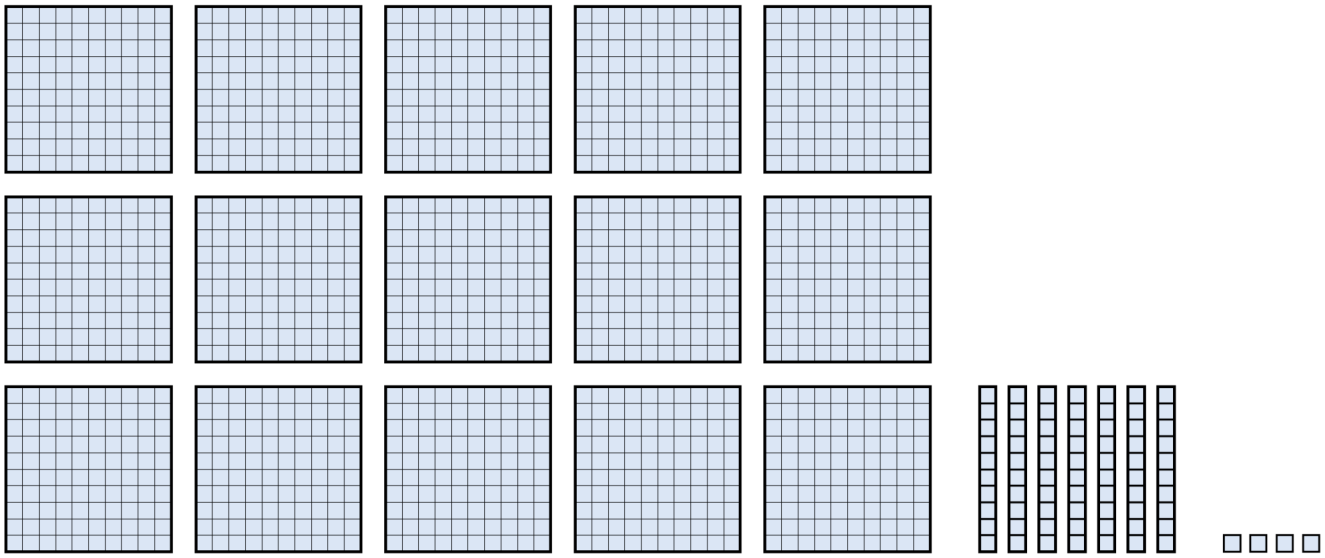
3. Numbers can be renamed

One number can be shown more than one way with blocks. 1574 is 1 thousand, 5 hundreds, 7 tens and 4 ones.



Blocks showing 1574 as 1 thousand, 5 hundreds, 7 tens and 4 ones.

Now swap the thousand cube for ten hundred flats. 10 hundreds + 5 hundreds = 15 hundreds. The same number is now 15 hundreds, 7 tens and 4 ones.

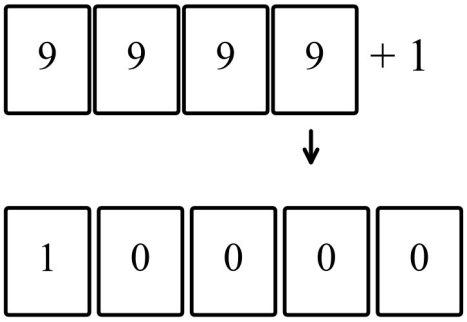


The same blocks after renaming: 15 hundreds, 7 tens and 4 ones.

Check: 15 hundreds is 1500, 7 tens is 70, 4 ones is 4. 1500 + 70 + 4 = 1574. Same number, new name.

4. What happens when we add one to a string of nines?

9999 is one less than 10 000. Add one, and every 9 becomes a 0 while a new 1 comes into the tens of thousands place.



$$9999 + 1 = 10\,000$$

Number cards showing 9999 plus 1 makes 10 000.

The same thing happens at every string of nines.

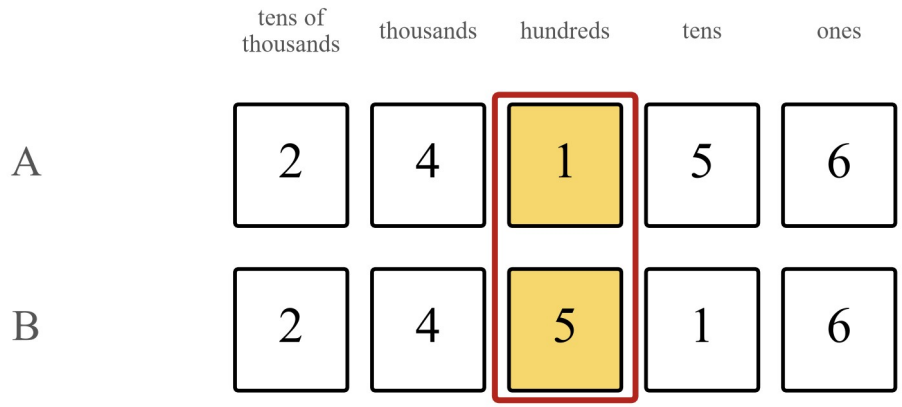
number	one more	what changes
999	1 000	the ones, tens and hundreds roll over to 0
9 999	10 000	all four places roll over to 0
10 099	10 100	the ones and tens change
19 999	20 000	the ones, tens, hundreds and thousands roll over
99 999	100 000	all five places roll over to 0

Adding ten or one hundred works the same way: 10 more than 9 990 is 10 000, and 100 more than 9 900 is 10 000. When a place fills up to ten, it makes one of the next place.

5. Ordering numbers beyond 10 000

To order numbers, first count the digits. A number with fewer digits is less: 9 999 has four digits and 10 001 has five, so 9 999 < 10 001.

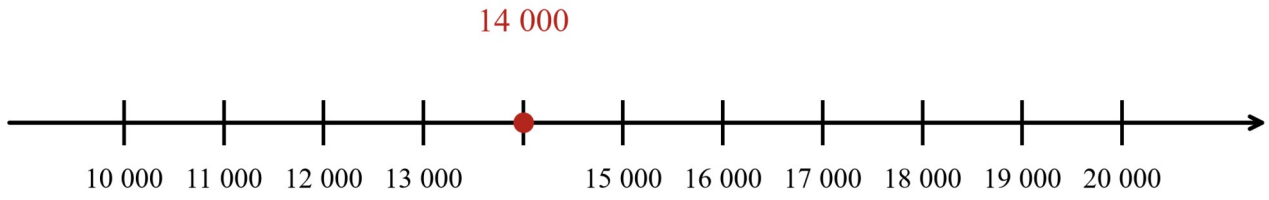
If two numbers have the same number of digits, look at the digits from the biggest place. The first place that is different decides which number is the biggest.



Two rows of number cards, 24 156 and 24 516, with the hundreds place ringed in red.

24 156 and 24 516 both have five digits. The tens of thousands are the same (2) and the thousands are the same (4). The hundreds are different: 1 hundred is less than 5 hundreds, so 24 156 < 24 516.

A number line puts numbers in order too. Counting on by thousands, the numbers go up as you move to the right.



A number line from 10 000 to 20 000 counting by thousands, with a dot on 14 000.

6. Another way to name numbers

Our number system is the Hindu-Arabic numeral system, and there are other systems too. The Japanese numeral system has a sign for each of 1, 10, 100, 1000 and 10 000: 一, 十, 百, 千, 万 (VC2M3N02.E04). 万 means ten thousand, so 十万 means ten tens of thousands: 100 000. Our system does the same job with a place and a space: 100 000.

Worked examples

Example 1 — with help

Read this chart. Write the number with a space, then write it in words.

hundreds of thousands	tens of thousands	ones of thousands
	6	3
	60 000	3 000

hundreds	tens	ones
2	0	8
200	0	8

A place-value chart showing 63 208 and what the digits are worth.

Working	What we did
Read the digits: 6, 3, 2, 0, 8.	Read each place from the left.
Group in threes from the right: 63 208.	Put a space between the thousands part and the ones part.
Thousands part: 63 — *sixty-three thousand*.	Read the first group, then say *thousand*.
Ones part: 208 — *two hundred and eight*.	Read the last group.

The number is **63 208**: *sixty-three thousand, two hundred and eight*.

Example 2 — with help

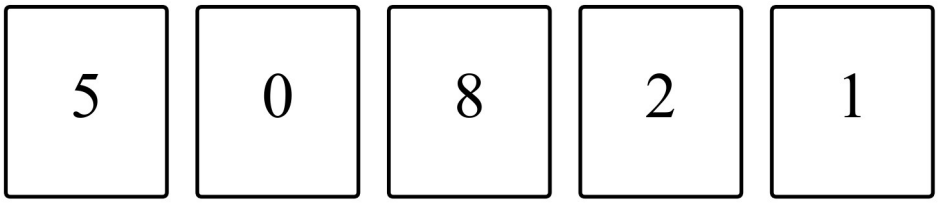
Rename 3204 in two ways.

Working	What we did
3204 = 3 thousands, 2 hundreds, 0 tens, 4 ones.	Read the chart the way we always do.
Swap the thousands: 30 hundreds + 2 hundreds = 32 hundreds.	One thousand is ten hundreds.
3204 = 32 hundreds and 4 ones.	The tens place stays 0.

Check: 32 hundreds is 3200, and 3200 + 4 = 3204. ✓

Example 3 — on your own

Five number cards: 5, 0, 8, 2 and 1. Use all five cards to make the biggest number you can, and the smallest number you can.



Five number cards: 5, 0, 8, 2 and 1.

Biggest: put the biggest cards in the biggest places — 8, 5, 2, 1, 0 — which is **85 210**.

Smallest: the first card cannot be 0, or the number would only have four digits. Put the smallest card that is not 0 first, then the rest from smallest to biggest — 1, 0, 2, 5, 8 — which is **10 258**.

Both are beyond 10 000, and 10 258 < 85 210.

Practice questions

With help

Q1. Read the chart.

hundreds of thousands	tens of thousands	ones of thousands
	2	8
	?	?

hundreds	tens	ones
4	0	5
?	?	?

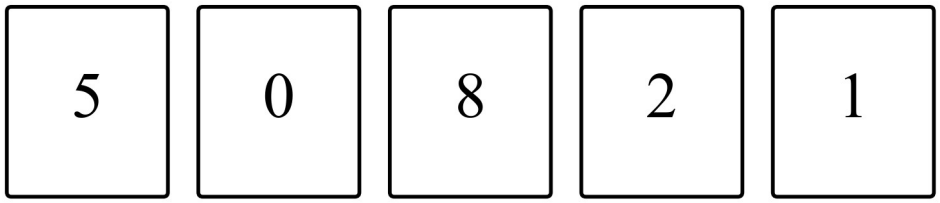
A place-value chart showing 28 405, with the values of the digits left blank.

(a) Write the number with a space.
(b) Write the number in words.
(c) Fill in the bottom row: what are the digits worth?

Q2. Rename the number. 4372 = ____ hundreds, ____ tens and ____ ones.

Q3. Write each number with a space: (a) 425000 (b) 63208 (c) 120456

Q4. Five number cards: 5, 0, 8, 2 and 1.

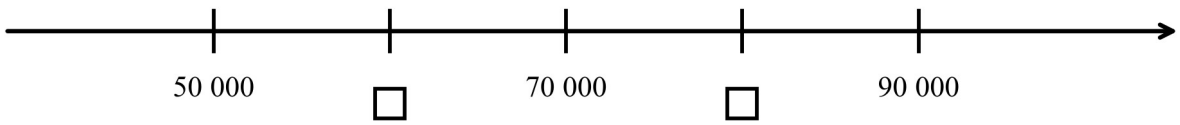


Five number cards: 5, 0, 8, 2 and 1.

(a) Make the biggest number you can.
(b) Make the smallest number you can.
(c) Which of your two numbers is the biggest? How do you know?

Q5. What is one more than: (a) 9 999 (b) 10 099 (c) 19 999?

Q6. Fill in the blanks on the number line.



A number line from 50 000 to 90 000 counting by tens of thousands, with two blank boxes.

Q7. Write < or > in the box: (a) 24 156 ____ 24 516 (b) 9 999 ____ 10 001 (c) 100 024 ____ 99 999

Q8. Put in order, smallest to biggest: 41 208, 41 820, 41 028.

On your own

Q9. Write in digits: (a) fifty-one thousand, three hundred and four (b) one hundred thousand (c) seventy thousand, six hundred and twenty

Q10. Write in words: (a) 12 305 (b) 80 047 (c) 200 000

Q11. Rename: (a) 6250 = ____ hundreds and ____ tens (b) 9040 = ____ hundreds and ____ tens (c) 3460 = ____ tens

Q12. What is the 7 worth? (a) 47 201 (b) 71 630 (c) 12 074

Q13. (a) What is one more than 39 999? (b) What is ten more than 99 990? (c) What is one hundred more than 99 900? (d) What do you notice about your three answers?

Q14. Put in order, smallest to biggest: 12 405, 9 876, 100 200, 12 540.

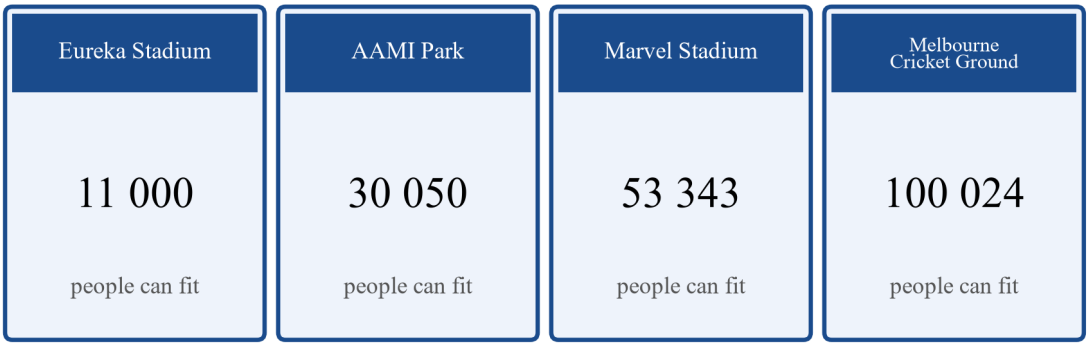
Q15. Put in order, biggest to smallest: 64 012, 46 120, 64 210, 64 102.

Q16. I am between 30 000 and 40 000. I have 2 in the thousands place and 5 in the hundreds place, and my tens and ones are 0. What number am I?

Q17. The Japanese numeral system has 万 for ten thousand (VC2M3N02.E04). (a) Write 万 in our digits. (b) 十万 is ten tens of thousands. Write it in our digits.

Q18. Look at 60 042. (a) How many thousands does it have? (b) Why must we write the 0 in the thousands place?

Q19. Four stadiums in Victoria, and how many people can fit in each.



Four cards showing how many people can fit at Eureka Stadium, AAMI Park, Marvel Stadium and the Melbourne Cricket Ground.

Source: Wikipedia, *Melbourne Cricket Ground*, *Marvel Stadium*, *Melbourne Rectangular Stadium*, *Eureka Stadium*, retrieved 2026-08-20.

(a) Which stadium can fit the most people?
(b) Put the four numbers in order, smallest to biggest.
(c) 53 343 and 30 050 both have five digits. Which of the digits tells you which number is the biggest?
(d) 100 024 has six digits and the others have five. What does that tell you?

Answers

Q1. (a) 28 405. (b) *Twenty-eight thousand, four hundred and five.* (c) 20 000, 8 000, 400, 0, 5. **Q2.** 43 hundreds, 7 tens and 2 ones. **Q3.** (a) 425 000 (b) 63 208 (c) 120 456. **Q4.** (a) 85 210 (b) 10 258 (c) 85 210; its biggest place has an 8 and the other has a 1. **Q5.** (a) 10 000 (b) 10 100 (c) 20 000. **Q6.** 60 000 and 80 000. **Q7.** (a) < (b) < (c) >. **Q8.** 41 028, 41 208, 41 820. **Q9.** (a) 51 304 (b) 100 000 (c) 70 620. **Q10.** (a) *twelve thousand, three hundred and five* (b) *eighty thousand and forty-seven* (c) *two hundred thousand*. **Q11.** (a) 62 hundreds and 5 tens (b) 90 hundreds and 4 tens (c) 346 tens. **Q12.** (a) 7 000 (b) 70 000 (c) 70. **Q13.** (a) 40 000 (b) 100 000 (c) 100 000 (d) each string of nines rolls over to zeros and the next place gets one more. **Q14.** 9 876, 12 405, 12 540, 100 200. **Q15.** 64 210, 64 102, 64 012, 46 120. **Q16.** 32 500. **Q17.** (a) 10 000 (b) 100 000. **Q18.** (a) 0 thousands (b) the 0 keeps all the other digits in the right places. **Q19.** (a) the Melbourne Cricket Ground (b) 11 000, 30 050, 53 343, 100 024 (c) the tens of thousands: 5 is more than 3 (d) a number with six digits is always more than a number with five digits, so the MCG fits the most people.

Worked answers

Q1. (a) The digits are 2, 8, 4, 0, 5. Group in threes from the right: 28 405. (b) Thousands part 28: *twenty-eight thousand*. Ones part 405: *four hundred and five*. Together: *twenty-eight thousand, four hundred and five*. (c) The 2 is worth 20 000, the 8 is worth 8 000, the 4 is worth 400, the 0 is worth 0 and the 5 is worth 5.

Q2. 4 thousands and 3 hundreds = 43 hundreds. So 4372 = 43 hundreds, 7 tens and 2 ones. Check: 4300 + 70 + 2 = 4372. ✓

Q3. Group in threes from the right and leave a space: (a) 425 000 (b) 63 208 (c) 120 456.

Q4. (a) Biggest cards in the biggest places: 85 210. (b) Smallest card that is not 0 first, then the rest from smallest to biggest: 10 258. (c) 85 210 is the biggest. Both have five digits, and at the tens of thousands place 8 is more than 1.

Q5. (a) 9 999 + 1 = 10 000. (b) 10 099 + 1 = 10 100. (c) 19 999 + 1 = 20 000.

Q6. Counting on by tens of thousands: 50 000, 60 000, 70 000, 80 000, 90 000. The blanks are 60 000 and 80 000.

Q7. (a) Same five digits until the hundreds: 1 < 5, so 24 156 < 24 516. (b) 9 999 has four digits and 10 001 has five, so 9 999 < 10 001. (c) 100 024 has six digits and 99 999 has five, so 100 024 > 99 999.

Q8. All have five digits and the same tens of thousands (4). Look at the hundreds: 0, 2, 8. So 41 028, 41 208, 41 820.

Q9. (a) 51 304 (b) 100 000 (c) 70 620.

Q10. (a) 12 305: *twelve thousand, three hundred and five*. (b) 80 047: *eighty thousand and forty-seven*. (c) 200 000: *two hundred thousand*.

Q11. (a) 6 thousands and 2 hundreds = 62 hundreds, so 6250 = 62 hundreds and 5 tens. (b) 9 thousands and 0 hundreds = 90 hundreds, so 9040 = 90 hundreds and 4 tens. (c) 3460 = 346 tens, because 346 × 10 = 3460.

Q12. (a) The 7 is in the thousands place: 7 000. (b) The 7 is in the tens of thousands place: 70 000. (c) The 7 is in the tens place: 70.

Q13. (a) 39 999 + 1 = 40 000. (b) 99 990 + 10 = 100 000. (c) 99 900 + 100 = 100 000. (d) Each answer rolls over: the nines become zeros and the next place gets one more, just like 9999 + 1 = 10 000.

Q14. 9 876 has only four digits, so it is smallest. 100 200 has six digits, so it is biggest. 12 405 and 12 540: the hundreds decide, 4 < 5. So 9 876, 12 405, 12 540, 100 200.

Q15. 46 120 is smallest: it has 4 tens of thousands, not 6. The other three: look at the hundreds — 2, 1, 0. Biggest to smallest: 64 210, 64 102, 64 012, then 46 120.

Q16. Between 30 000 and 40 000 means 3 tens of thousands. Thousands 2, hundreds 5, tens 0, ones 0: the number is 32 500.

Q17. (a) 万 = 10 000. (b) 十万 = 10 × 10 000 = 100 000.

Q18. (a) The thousands place is 0, so 60 042 has 0 thousands. (b) The 0 holds the thousands place so the 6 stays in the tens of thousands place and the 4 stays in the hundreds place. Without it the 6 would slide into the thousands place and we would read 6 042 — six thousand and forty-two — and that is much less.

Q19. (a) The Melbourne Cricket Ground, 100 024. (b) 11 000 < 30 050 < 53 343 < 100 024. (c) Look at the tens of thousands place: 5 tens of thousands is more than 3 tens of thousands, so 53 343 > 30 050. (d) A number with six digits is always more than a number with five digits, so the MCG number is the biggest of the four.

Adding and subtracting two- and three-digit numbers

Code: VC2M3N04 (.E01, .E02, .E03, .E04, .E05, .E06)

> *add and subtract two- and three-digit numbers using place value to partition, rearrange and regroup numbers to assist in calculations without a calculator* — VC2M3N04

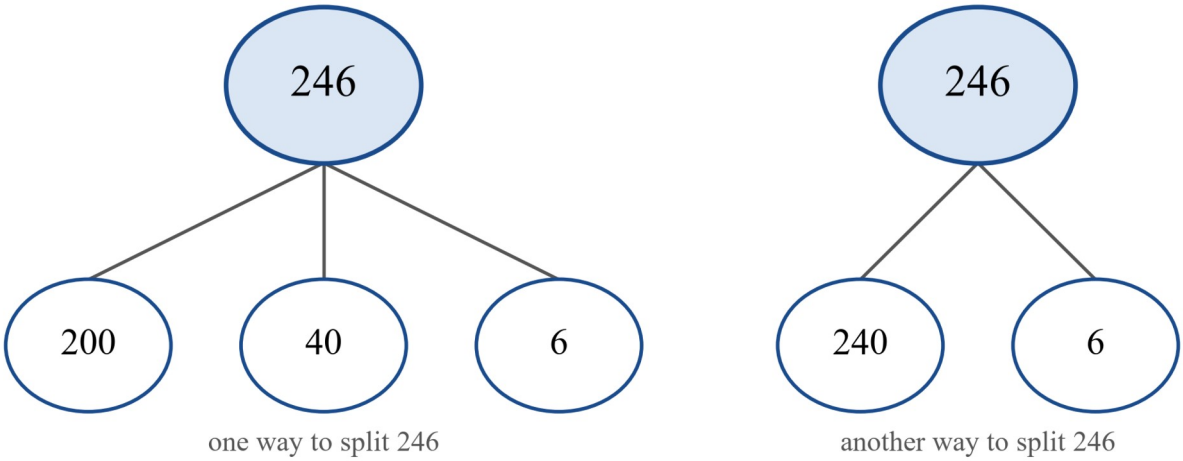
In this topic you will add and subtract numbers like 248 and 517 by splitting them into parts. You will use blocks, jottings and number lines, and you will check your answers with the matching number sentence. You will not need a calculator.

You will need: blocks, a number line and a pencil.

Learn about adding and subtracting

1. Split numbers into parts

To **partition** a number means to split it into parts that add back up to the whole number.

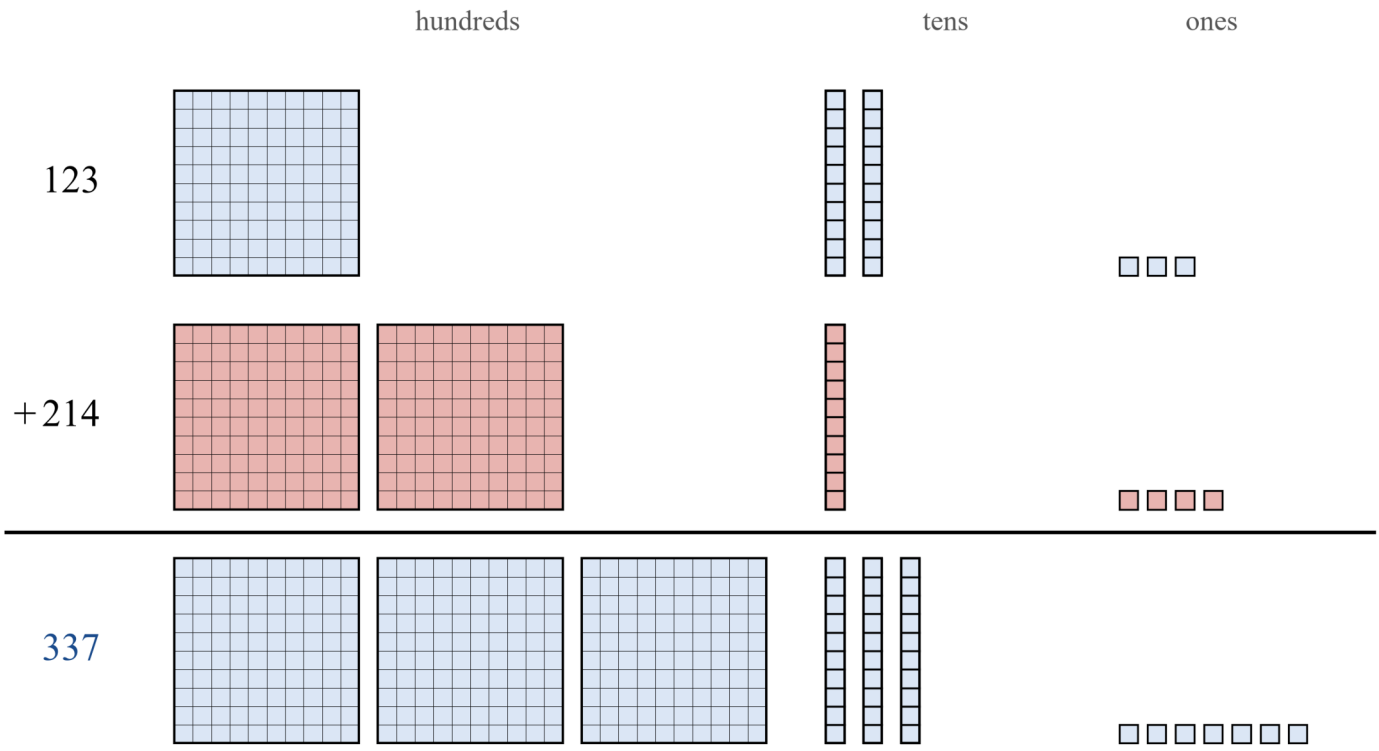


Two part-part-whole models. Left: 246 split into 200, 40 and 6. Right: 246 split into 240 and 6.

246 = 200 + 40 + 6 is the partition we use most, because each part shows a place. But 246 = 240 + 6 is a good partition too. (VC2M3N04.E01)

2. Add with blocks

Line up the hundreds, the tens and the ones, then add each place.



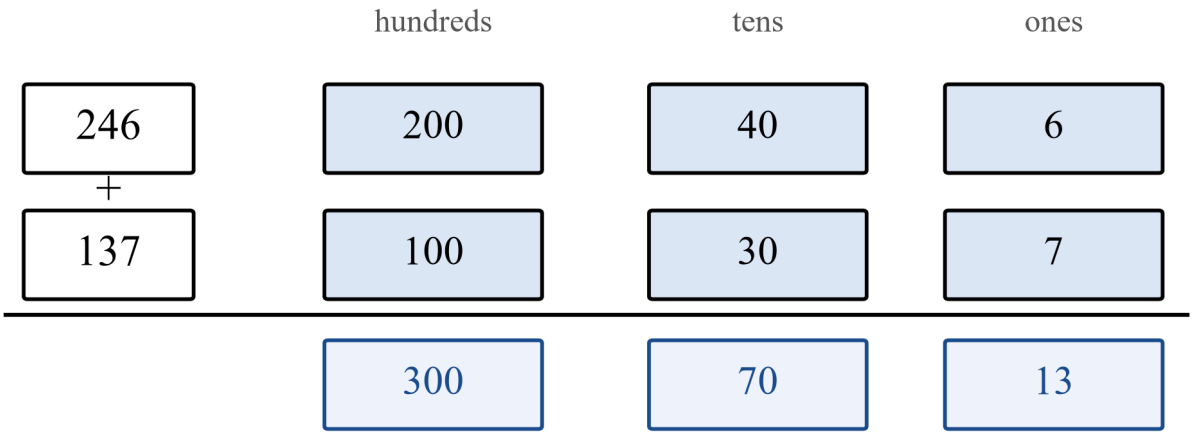
Add the hundreds, add the tens, add the ones: 300 + 30 + 7 = 337

Blocks lined up under hundreds, tens and ones: 123 as 1 flat, 2 rods and 3 cubes; 214 as 2 flats, 1 rod and 4 cubes; below the line, 337 as 3 flats, 3 rods and 7 cubes.

1 hundred + 2 hundreds = 3 hundreds. 2 tens + 1 ten = 3 tens. 3 ones + 4 ones = 7 ones. So 123 + 214 = 337. (VC2M3N04.E02)

3. Jottings

Jottings are quick notes you write down to help you work things out. Partition both numbers, add each place, then add the parts.



Now add the parts:

$$300 + 70 + 13 = 383$$

13 ones is the same as 1 ten and 3 ones

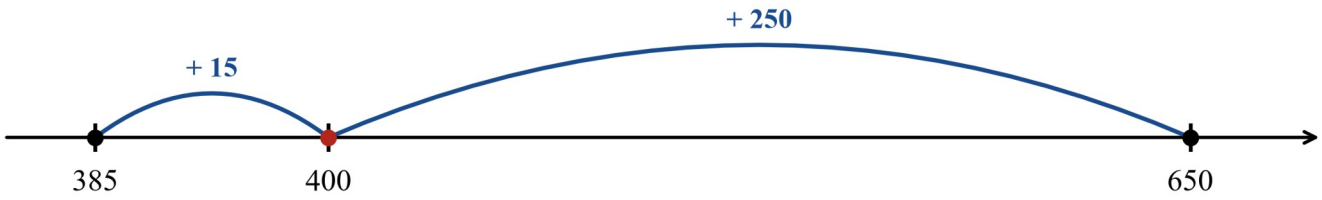
Cards showing 246 as 200, 40 and 6 and 137 as 100, 30 and 7, with 300, 70 and 13 below the line, then 300 + 70 + 13 = 383.

200 + 100 = 300, 40 + 30 = 70 and 6 + 7 = 13. Then 300 + 70 + 13 = 383. So 246 + 137 = 383.

4. Make the next hundred first

Sometimes a clever split makes the work easy. To add 265 to 385, first give 385 the 15 it needs to make 400.

Split 265 into 15 and 250



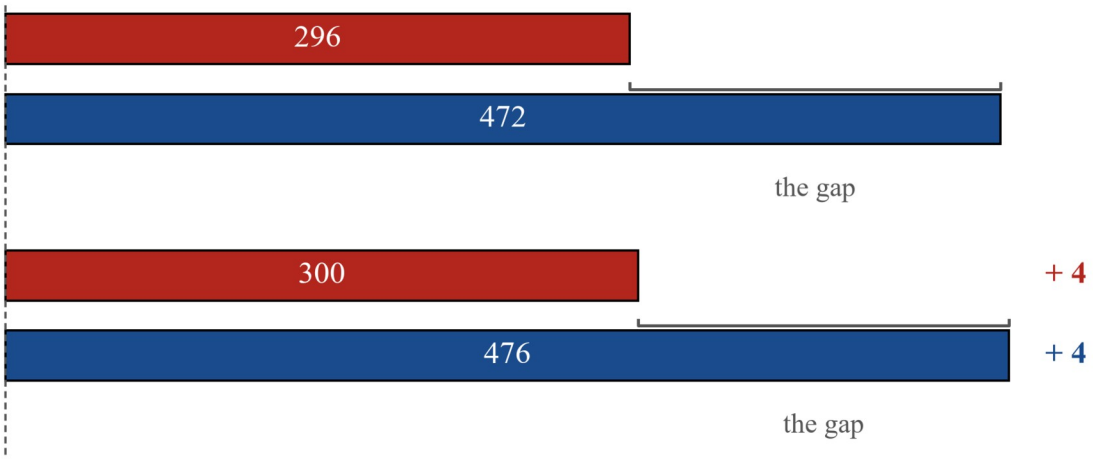
385 + 15 = 400, then 400 + 250 = 650

A number line with a jump of 15 from 385 to 400 and a jump of 250 from 400 to 650.

Split 265 into 15 and 250. Then 385 + 15 = 400, and 400 + 250 = 650. So 385 + 265 = 650. (VC2M3N04.E03)

5. Give both numbers the same amount

To take away 296 from 472, first make 296 into 300 by giving it 4 more. Give 472 the same 4 more, so the gap between the numbers stays the same.



Give both numbers 4 more. The gap stays the same, so 476 − 300 = 176.

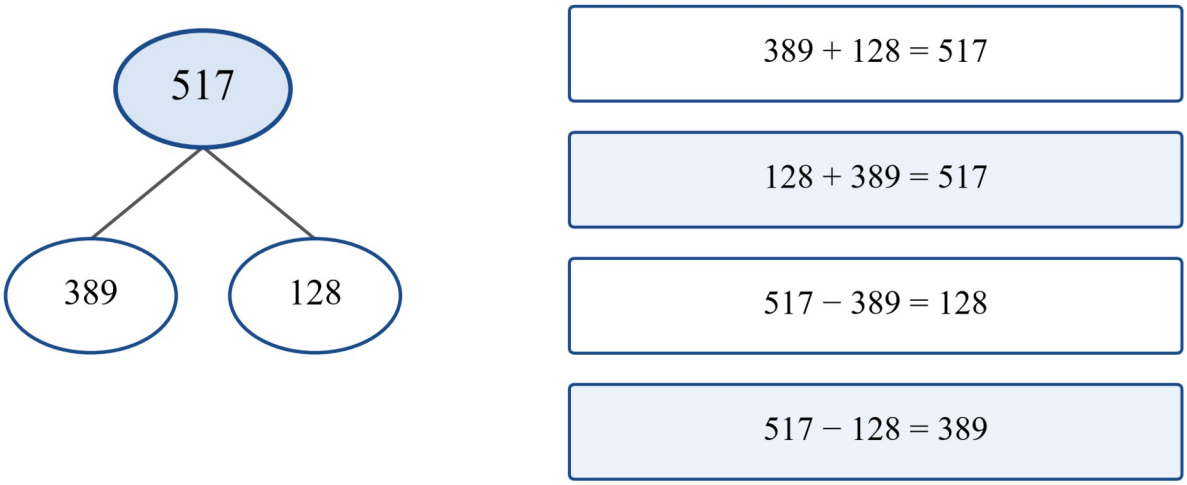
Bars for 472 and 296 with the gap marked, then bars for 476 and 300 after both numbers get 4 more, with the same gap.

472 + 4 = 476 and 296 + 4 = 300. Now 476 − 300 = 176, so 472 − 296 = 176. (VC2M3N04.E04)

Giving both numbers the same amount does not change the gap between them.

6. Check subtraction with addition

Addition and subtraction undo each other. The parts 389 and 128 make 517, so the same three numbers give four number sentences.



Addition and subtraction undo each other.

A part-part-whole model with whole 517 and parts 389 and 128, next to the number sentences 389 + 128 = 517, 128 + 389 = 517, 517 − 389 = 128 and 517 − 128 = 389.

Use the matching addition to check any subtraction. (VC2M3N04.E01)

7. The same ideas work past 1 000

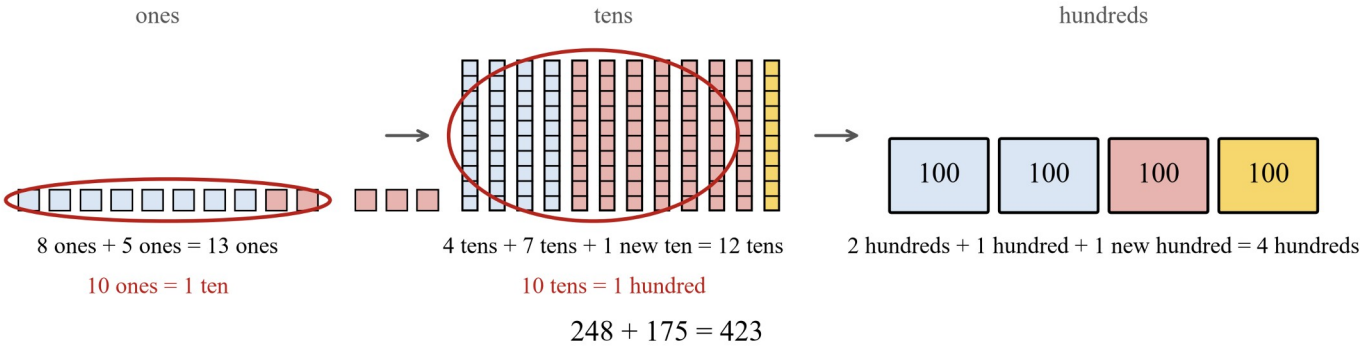
Partition the numbers the same way: 1 240 = 1 000 + 200 + 40 and 3 350 = 3 000 + 300 + 50. Add each place: 1 000 + 3 000 = 4 000, 200 + 300 = 500 and 40 + 50 = 90. Then 4 000 + 500 + 90 = 4 590. So 1 240 + 3 350 = 4 590. (VC2M3N04.E06)

Worked examples

Example 1 — with help

Work out 248 + 175. Partition both numbers, and regroup when a place makes 10 or more.

Working	What we did
248 = 200 + 40 + 8 and 175 = 100 + 70 + 5	Partitioned both numbers.
200 + 100 = 300	Added the hundreds.
40 + 70 = 110	Added the tens. 110 is 100 and 10.
8 + 5 = 13	Added the ones. 13 is 10 and 3.
300 + 110 + 13 = 423	Added the parts. The two extra tens regroup into a new hundred.



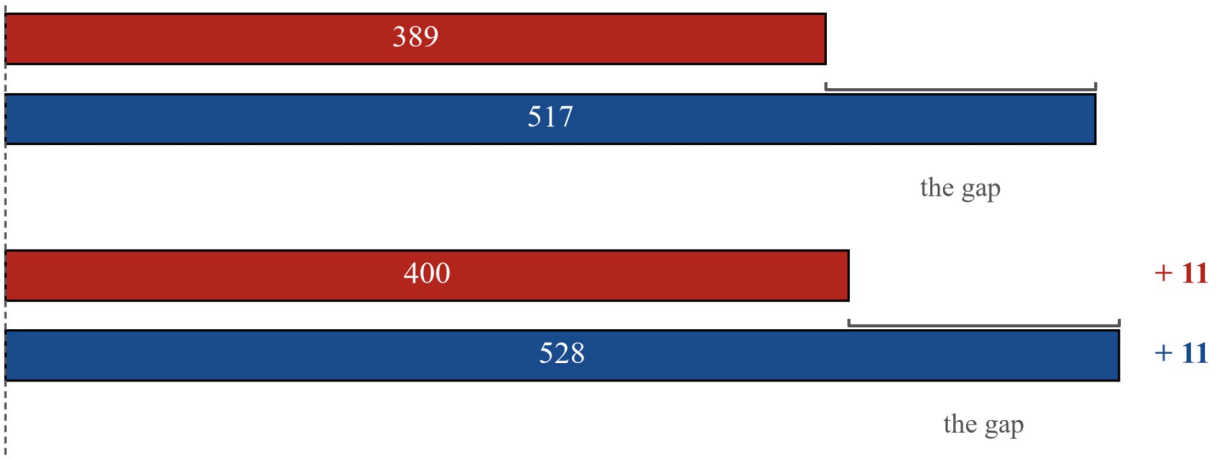
13 ones circled as 10 and 3, 12 tens circled as 10 and 2, and 4 hundred cards, showing the regrouping in 248 + 175 = 423.

The blocks show the regrouping: 13 ones make 1 new ten with 3 left over, and 12 tens make 1 new hundred with 2 left over, so there are 4 hundreds in all. 248 + 175 = 423. ✓

Example 2 — with help

Work out 517 − 389. Give both numbers the same amount so that 389 becomes 400.

Working	What we did
389 + 11 = 400	Found how much 389 needs to make 400.
517 + 11 = 528	Gave 517 the same 11 more.
528 − 400 = 128	Took away 400.
128 + 389 = 517 ✓	Checked with addition.



Give both numbers 11 more. The gap stays the same, so 528 − 400 = 128.

Bars for 517 and 389 with the gap marked, then bars for 528 and 400 after both numbers get 11 more, with the same gap.

The gap between the bars is the same in both rows, so 517 − 389 = 128. ✓

Example 3 — on your own

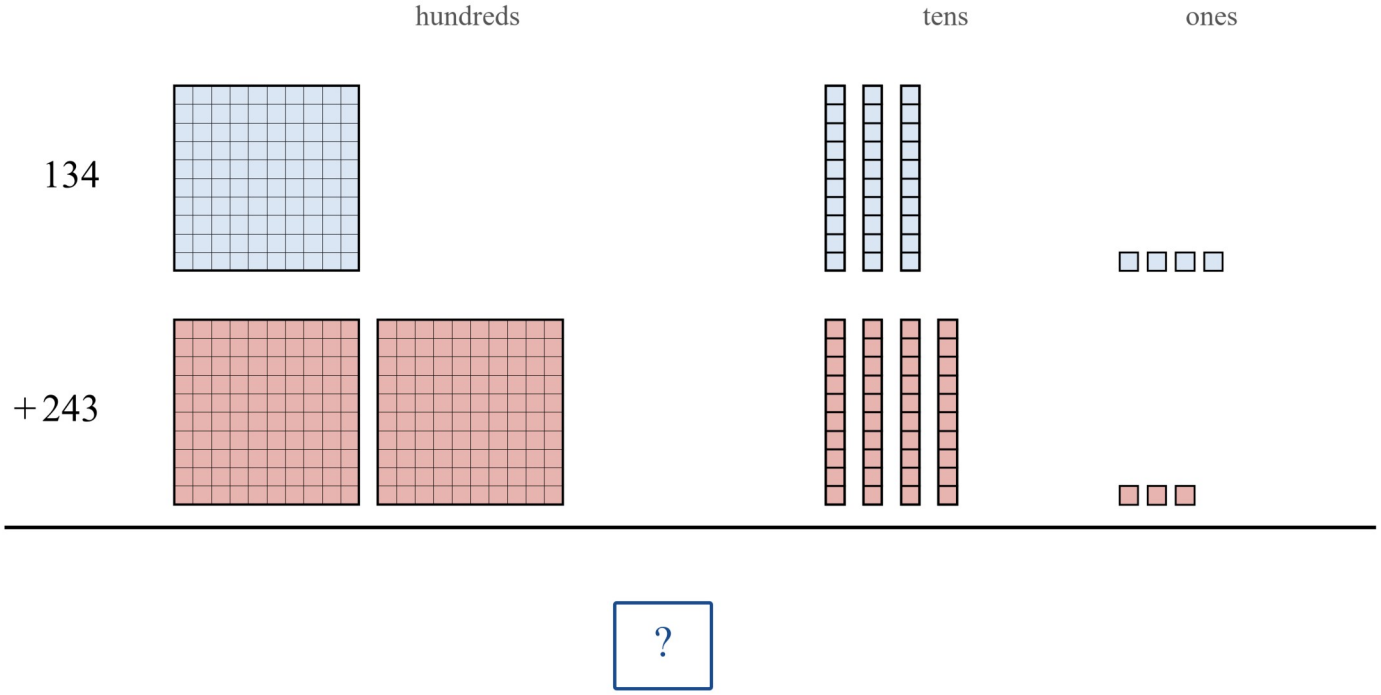
Work out 368 + 157. Choose a split that makes a hundred first, and say why you chose it. (VC2M3N04.E05)

368 needs 32 to make 400, so split 157 into 32 and 125. Then 368 + 32 = 400, and 400 + 125 = 525. So 368 + 157 = 525. ✓ The split was chosen because it makes a hundred first, and the rest is easy to add.

Practice questions

With help

Q1. Add with the blocks. What is 134 + 243?



Add the hundreds, the tens and the ones. What is 134 + 243?

Blocks lined up under hundreds, tens and ones: 134 as 1 flat, 3 rods and 4 cubes; 243 as 2 flats, 4 rods and 3 cubes; a ? card below the line.

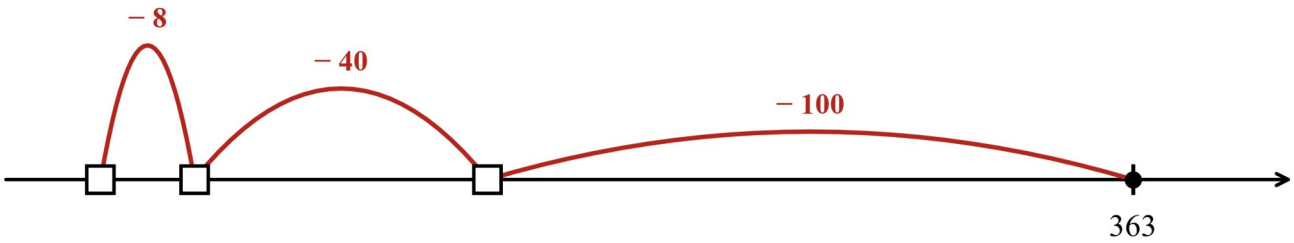
Q2. Partition both numbers and fill in the blanks: 253 + 146. 253 = 200 + 50 + 3 and 146 = 100 + __ + 6. 200 + 100 = **, 50 + 40 =** , 3 + 6 = **. Then add the parts:** .

Q3. Work out 347 + 285 with jottings. Remember to regroup when a place makes 10 or more.

Q4. 485 + 265. (a) 485 + 15 = __ (b) 265 = 15 + __ (c) So 485 + 265 = 500 + __ = __

Q5. 534 − 395. Give both numbers 5 more: 534 + 5 = __ and 395 + 5 = **. Now take away:** − __ = __.

Q6. Follow the jumps on the number line. What numbers go in the boxes?



Start at 363. Follow the jumps. What numbers do you land on?

A number line starting at 363 with back jumps of 100, 40 and 8, landing on three blank boxes.

Q7. The whole is 415 and one part is 178. Find the other part, then write the matching addition and subtraction.

Q8. You want to work out 385 + 265 by making a hundred first. Circle the split of 265 that helps: (a) 200 + 65 (b) 15 + 250 (c) 100 + 165. Say why it helps. (VC2M3N04.E05)

On your own

Q9. Partition both numbers and add. (a) 352 + 237 (b) 468 + 275 (c) 617 + 194

Q10. Make a hundred first, then add. (a) 278 + 145 (b) 565 + 249

Q11. Take away. (a) 534 − 219 (b) 726 − 387 (c) 803 − 257

Q12. Give both numbers the same amount, then take away. (a) 452 − 297 (b) 613 − 386

Q13. Find the missing number. (a) 245 + __ = 500 (b) 415 − __ = 178 (c) __ − 244 = 368

Q14. Zoe says 517 − 389 = 138. Check her answer with addition. Is she right? If not, find the right answer.

Q15. Sam partitions 286 as 200 + 80 + 6. Priya partitions it as 6 + 280. They both want to work out 394 + 286. Whose split helps more? Say why, then find the answer.

Q16. A shop had 452 building bricks. It got 279 more. (a) How many bricks does the shop have now? (b) It sells 187 bricks. How many are left?

Q17. The answer is 500. Write two different additions that each use two three-digit numbers.

Q18. Use partitioning to work out 1 240 + 3 350.

Q19. The Royal Melbourne Show runs for 11 days every spring at the showgrounds in Ascot Vale, and about 500 000 people go each year.

Source: Wikipedia, *Royal Melbourne Show*, retrieved 2026-08-20.

The Royal Melbourne Show — visitors on three days

Saturday	Sunday	Monday
46 380	51 245	28 975
people came to the show	people came to the show	people came to the show

(These numbers are easy ones to work with, not the real crowd.)

Three cards for the Royal Melbourne Show: Saturday 46 380, Sunday 51 245 and Monday 28 975 people came to the show.

Here are easy numbers for three days of the show, not the real crowd.

(a) How many people came on Saturday and Sunday altogether?

(b) How many more people came on Sunday than on Monday?

(c) Do the three days add up to about 500 000? Why not?

Answers

Q1. 377. **Q2.** 40; 300, 90, 9; 399. **Q3.** 632. **Q4.** (a) 500 (b) 250 (c) 500 + 250 = 750. **Q5.** 539, 400; 539 − 400 = 139. **Q6.** 263, 223, 215. **Q7.** 237; 178 + 237 = 415 and 415 − 178 = 237. **Q8.** (b); 385 + 15 makes 400. **Q9.** (a) 589 (b) 743 (c) 811. **Q10.** (a) 423 (b) 814. **Q11.** (a) 315 (b) 339 (c) 546. **Q12.** (a) 155 (b) 227. **Q13.** (a) 255 (b) 237 (c) 612. **Q14.** No; 138 + 389 = 527, not 517; the right answer is 128. **Q15.** Priya's; 680. **Q16.** (a) 731 (b) 544. **Q17.** Any two, e.g. 250 + 250 and 300 + 200. **Q18.** 4 590. **Q19.** (a) 97 625 (b) 22 270 (c) No; the show runs for 11 days, and these are only 3 of them.

Worked answers

Q1. Add each place: 100 + 200 = 300, 30 + 40 = 70, 4 + 3 = 7. Then 300 + 70 + 7 = 377.

Q2. 146 = 100 + 40 + 6. Add each place: 200 + 100 = 300, 50 + 40 = 90, 3 + 6 = 9. Then 300 + 90 + 9 = 399.

Q3. 347 = 300 + 40 + 7 and 285 = 200 + 80 + 5. Add each place: 300 + 200 = 500, 40 + 80 = 120, 7 + 5 = 12. Then 500 + 120 + 12 = 632. The 12 ones regroup into 1 ten and 2 ones, and the 12 tens and 1 new ten regroup into 1 hundred and 3 tens.

Q4. (a) 485 + 15 = 500. (b) 265 = 15 + 250. (c) So 485 + 265 = 500 + 250 = 750.

Q5. 534 + 5 = 539 and 395 + 5 = 400. The gap stays the same, so 534 − 395 = 539 − 400 = 139.

Q6. 363 − 100 = 263, then 263 − 40 = 223, then 223 − 8 = 215. The boxes hold 263, 223 and 215, so 363 − 148 = 215.

Q7. The other part is 415 − 178 = 237. The matching number sentences are 178 + 237 = 415 and 415 − 178 = 237.

Q8. Split (b) helps, because 385 needs 15 to make 400. Then 385 + 15 = 400 and 400 + 250 = 650.

Q9. (a) 300 + 200 = 500, 50 + 30 = 80, 2 + 7 = 9; 500 + 80 + 9 = 589. (b) 400 + 200 = 600, 60 + 70 = 130, 8 + 5 = 13; 600 + 130 + 13 = 743. (c) 600 + 100 = 700, 10 + 90 = 100, 7 + 4 = 11; 700 + 100 + 11 = 811.

Q10. (a) 278 + 22 = 300, and 145 = 22 + 123, so 300 + 123 = 423. (b) 565 + 35 = 600, and 249 = 35 + 214, so 600 + 214 = 814.

Q11. (a) 534 − 200 = 334, 334 − 10 = 324, 324 − 9 = 315. (b) 726 − 300 = 426, 426 − 80 = 346, 346 − 7 = 339. (c) 803 − 200 = 603, 603 − 50 = 553, 553 − 7 = 546.

Q12. (a) 452 + 3 = 455 and 297 + 3 = 300, so 452 − 297 = 455 − 300 = 155. (b) 613 + 14 = 627 and 386 + 14 = 400, so 613 − 386 = 627 − 400 = 227.

Q13. (a) 500 − 245 = 255, so 245 + 255 = 500. (b) 415 − 178 = 237. (c) 368 + 244 = 612, so 612 − 244 = 368.

Q14. Check with addition: 138 + 389 = 527, and 527 is not 517, so Zoe is not right. The right answer is 128, because 128 + 389 = 517.

Q15. Priya's split helps more, because 394 needs 6 to make 400. Then 394 + 6 = 400 and 400 + 280 = 680, so 394 + 286 = 680. Sam's split works too, but it does not make a hundred as quickly.

Q16. (a) 452 + 279: 452 + 200 = 652, 652 + 70 = 722, 722 + 9 = 731. The shop has 731 bricks now. (b) 731 − 187: 731 − 100 = 631, 631 − 80 = 551, 551 − 7 = 544. There are 544 bricks left.

Q17. Any two different additions of two three-digit numbers that make 500, e.g. 250 + 250 = 500 and 300 + 200 = 500.

Q18. 1 000 + 3 000 = 4 000, 200 + 300 = 500, 40 + 50 = 90. Then 4 000 + 500 + 90 = 4 590.

Q19. (a) 46 380 + 51 245 = 97 625 people came on Saturday and Sunday altogether. (b) 51 245 − 28 975 = 22 270 more people came on Sunday than on Monday. (c) No. 97 625 + 28 975 = 126 600, which is only part of the crowd, because the show runs for 11 days and people come on all of them. The about 500 000 counts every day of the show.

Multiplying and dividing one- and two-digit numbers

Code: VC2M3N05 (.E01, .E02, .E03, .E04)

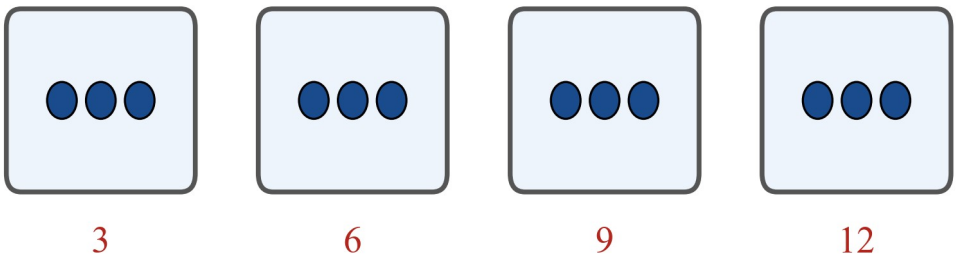
You already know your twos, threes, fours, fives and tens facts. In this topic you will use them to multiply and divide two-digit numbers too. You will use equal groups, arrays and bar models, and you will pick the best way to work each problem out.

You will need: counters, grid paper and a pencil.

Learn about multiplying and dividing

1. Multiplication means equal groups

Here are 4 groups of 3 counters.



Four boxes with three counters in each box. The counting numbers 3, 6, 9 and 12 are under the boxes.

Count on by threes, one three for each group:

3, 6, 9, 12

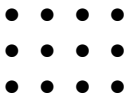
There are 12 counters. As a number sentence:

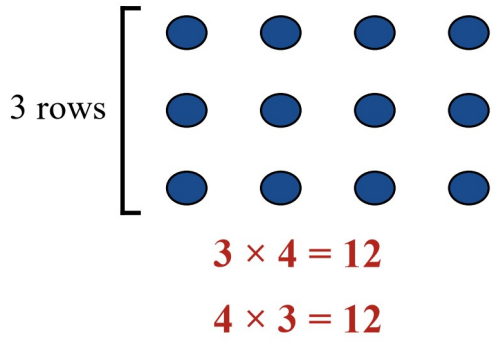
$4 \times 3 = 12$

We read this as *4 groups of 3 makes 12*.

2. An array shows the same fact two ways

The same 12 counters can sit in an **array** — equal rows, lined up.





An array of 12 dots in 3 rows of 4. The number sentences 3 times 4 is 12 and 4 times 3 is 12 are under it.

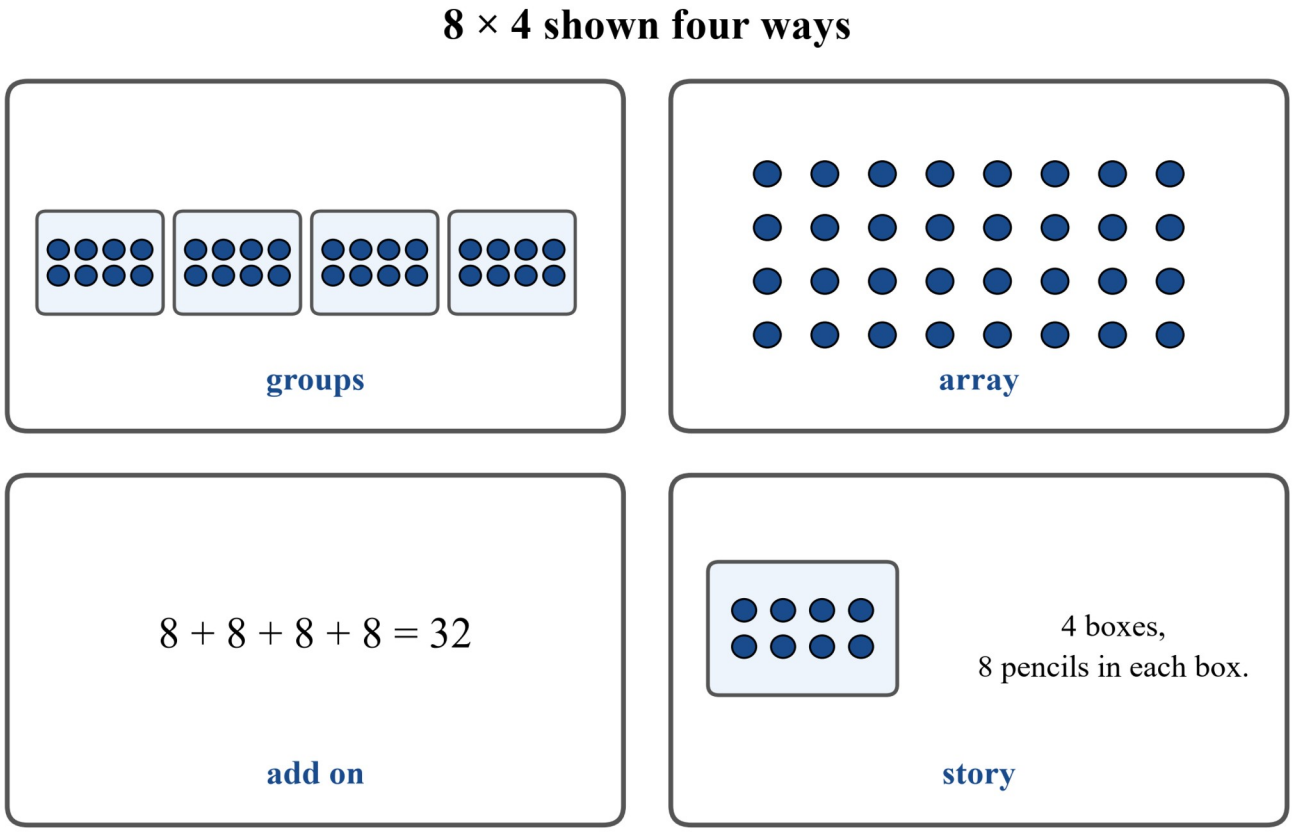
This array has 3 rows of 4. Counting the rows gives 3 × 4 = 12.

Now look at it the other way. There are 4 lines of 3 going down. So 4 × 3 = 12 as well.

One array, two number sentences. Turning a multiplication around does not change the answer.

3. One fact, four ways — a Think Board

You can show one fact in many ways. Here is 8 × 4 shown four ways.

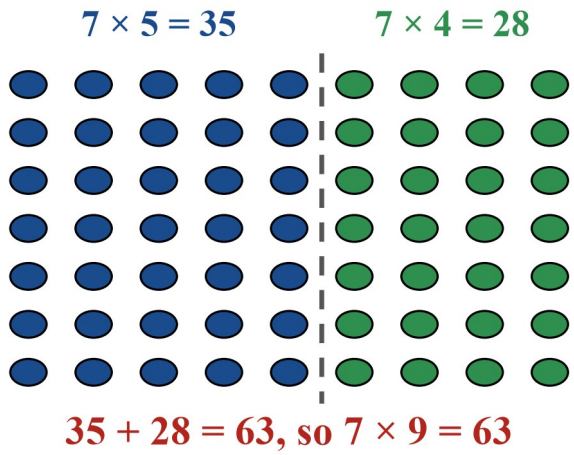


A Think Board showing 8 times 4 four ways: as groups of 8, as an array, as adding 8 on, and as a story about 4 boxes with 8 pencils in each box.

All four boxes show the same 32: 4 groups of 8, an array, adding 8 on four times, and a story. When you learn a new fact, a Think Board helps you see it from every side.

4. Split a number into parts you know

What about 7 × 9? Nines are not a fact you have to know yet. So split the 9 into 5 and 4 — two facts you do know.



An array of 63 dots in 7 rows of 9, split into a blue part labelled 7 times 5 is 35 and a green part labelled 7 times 4 is 28. Under it: 35 plus 28 is 63, so 7 times 9 is 63.

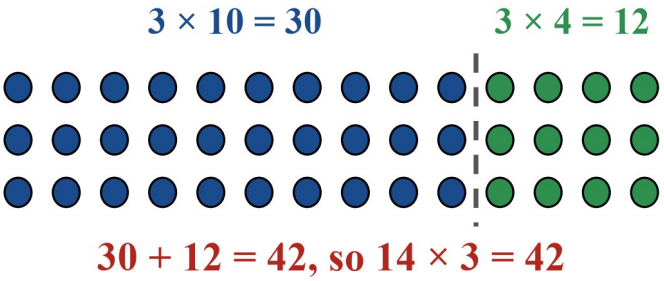
7 × 5 = 35 (a fives fact) and 7 × 4 = 28 (a fours fact).

35 + 28 = 63, so 7 × 9 = 63.

You can always split one number into parts that are friendly facts.

5. Tens and ones for two-digit numbers

14 × 3 looks big, but 14 is just 10 + 4.



An array of 42 dots in 3 rows of 14, split into a blue part labelled 3 times 10 is 30 and a green part labelled 3 times 4 is 12. Under it: 30 plus 12 is 42, so 14 times 3 is 42.

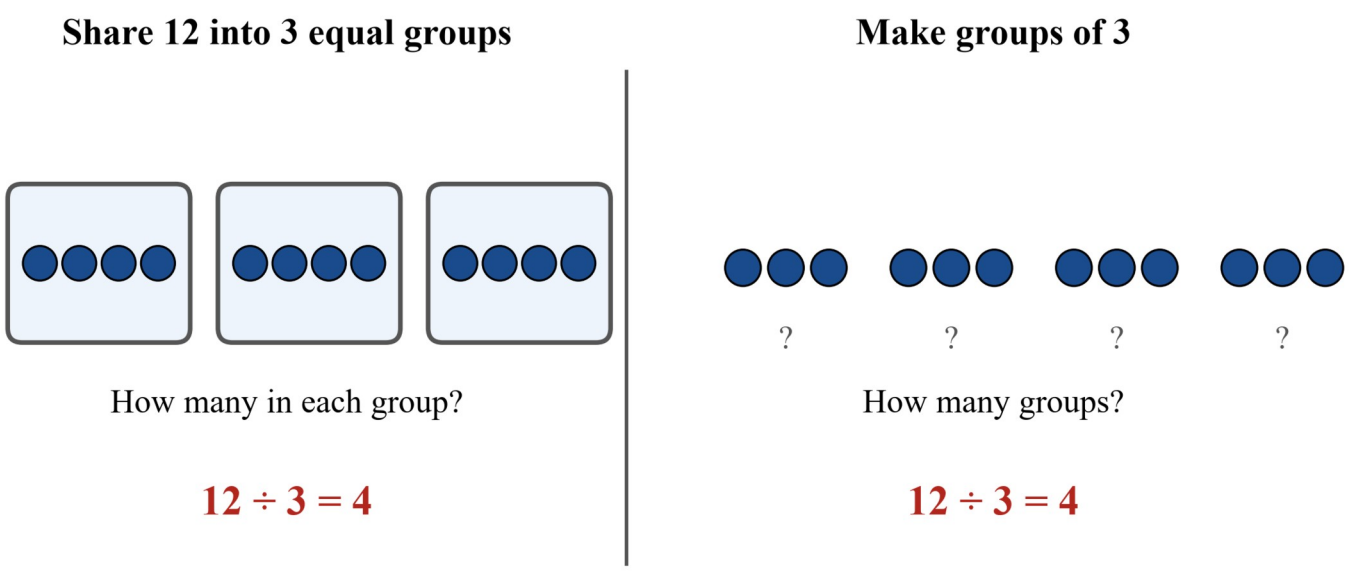
3 rows of 10 is 3 × 10 = 30.

3 rows of 4 is 3 × 4 = 12.

30 + 12 = 42, so 14 × 3 = 42.

6. Division means equal groups

Division is sharing into equal groups. There are two ways to see it.



Two pictures of 12 divided by 3. Left: 12 dots shared into 3 equal groups of 4, asking how many in each group. Right: 12 dots made into 4 groups of 3, asking how many groups. Both give 12 divided by 3 is 4.

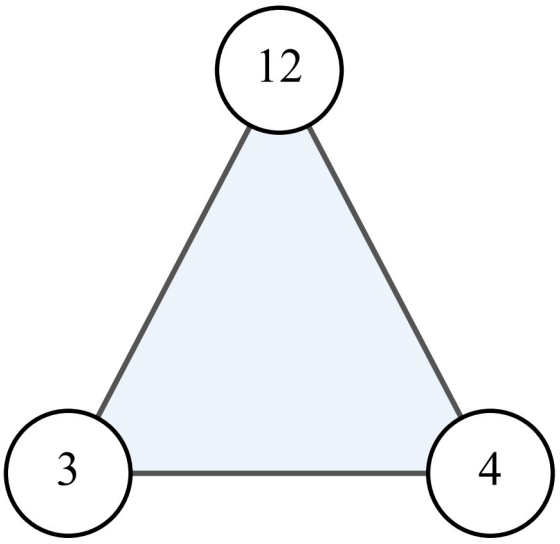
Share 12 into 3 equal groups: 4 in each group. 12 ÷ 3 = 4.

Or make groups of 3 from 12: you make 4 groups. That is 12 ÷ 3 = 4 too.

Same number sentence, two ways to see it.

7. Multiplication and division go together

The three numbers 3, 4 and 12 live in one fact family.



3 × 4 = 12

4 × 3 = 12

12 ÷ 3 = 4

12 ÷ 4 = 3

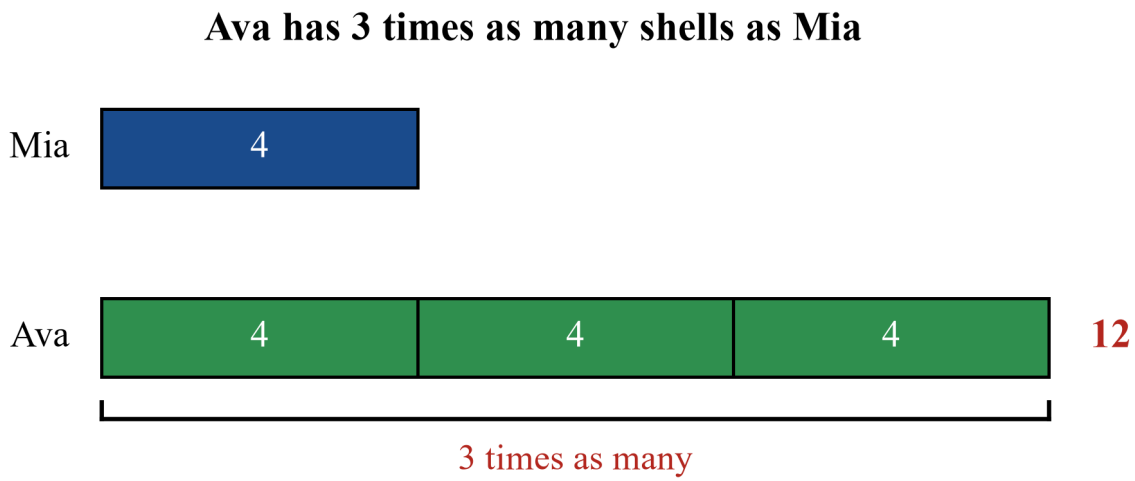
A fact triangle with 12 on top and 3 and 4 at the bottom, next to the four facts 3 times 4 is 12, 4 times 3 is 12, 12 divided by 3 is 4, and 12 divided by 4 is 3.

If you know 3 × 4 = 12, you also know 12 ÷ 3 = 4 and 12 ÷ 4 = 3.

So a times fact is a helping fact for division. To work out 35 ÷ 5, ask: *5 times what makes 35?* 5 × 7 = 35, so 35 ÷ 5 = 7.

8. 'Times as many' — choosing × or ÷

Mia found 4 shells. Ava found 3 times as many as Mia.



A bar model. Mia's bar is 4 long. Ava's bar is 3 lots of 4, making 12. The words '3 times as many' are under Ava's bar.

Ava's shells are 3 lots of 4: 3 × 4 = 12. Ava found 12 shells.

Now the other way. If you know Ava found 12 shells, and that is 3 times Mia's number, ask: *3 times what makes 12?* 12 ÷ 3 = 4. Mia found 4 shells.

The same picture can ask for × or for ÷. Read the story, then pick.

Worked examples

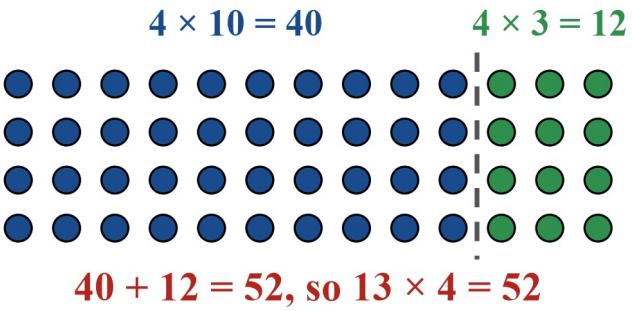
Example 1 — with help

At the art table, 6 students each make 4 paper stars. How many paper stars altogether?

Working	What we did
6 groups of 4	The story says *each* — that means equal groups.
4, 8, 12, 16, 20, 24	Counted on by fours, one four for each group.
6 × 4 = 24	Wrote the number sentence.
There are 24 paper stars altogether. ✓	Answered the question.

Example 2 — with help

Ben fills 13 sticker pages. Each page holds 4 stickers. How many stickers does he use?



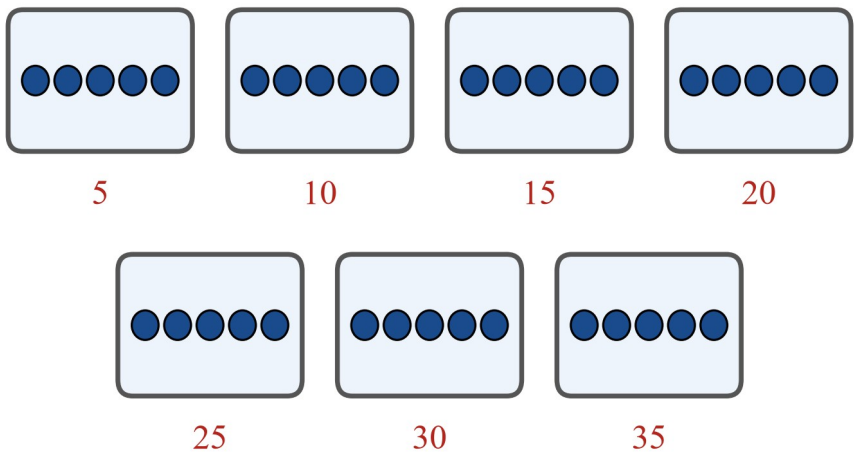
An array of 52 dots in 4 rows of 13, split into a blue part labelled 4 times 10 is 40 and a green part labelled 4 times 3 is 12. Under it: 40 plus 12 is 52, so 13 times 4 is 52.

Working	What we did
13 = 10 + 4	Split 13 into tens and ones.
4 × 10 = 40	4 stickers on each of the 10 pages.
4 × 3 = 12	4 stickers on each of the 3 pages.
40 + 12 = 52	Added the two parts.
13 × 4 = 52. Ben uses 52 stickers. ✓	Joined the parts to get the answer.

Example 3 — on your own

Zoe has 35 stickers. She puts 5 on each page. How many pages does she fill?

Ask: *5 times what makes 35?* 5 × 7 = 35, so 35 ÷ 5 = 7. Zoe fills 7 pages. ✓

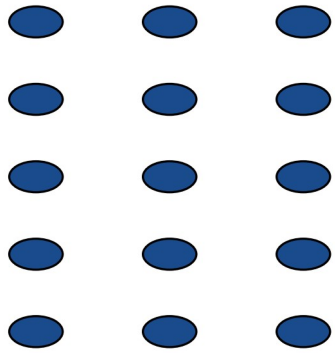


Seven pages with five stickers on each page. The counting numbers 5, 10, 15, 20, 25, 30 and 35 are under the pages.

Practice questions

With help

Q1. Write two number sentences for this array.



An array of 15 dots in 5 rows of 3.

Q2. Match each story to its number sentence.

(a) 3 jars hold 6 marbles each. How many marbles?

(b) 18 marbles are shared equally into 3 jars. How many in each jar?

(c) 18 marbles are put into jars of 6. How many jars?

Number sentences: $18 \div 6 = 3$ · $3 \times 6 = 18$ · $18 \div 3 = 6$

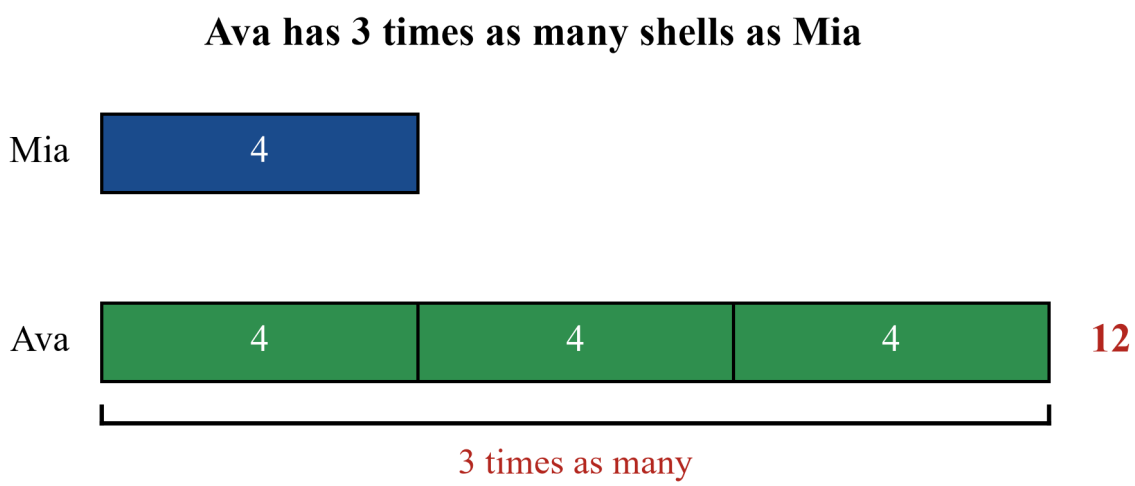
Q3. Fill in the missing number. (a) $4 \times \square = 20$ (b) $30 \div \square = 6$ (c) $\square \times 2 = 18$ (d) $45 \div 5 = \square$

Q4. Count on by fives to find 7×5. Fill in the missing numbers: 5, 10, , , 25, , .

Q5. Split and multiply: 16×3. $16 = 10 + 6$. $10 \times 3 = 30$. $6 \times 3 =$. *30 + = _*.

Q6. 24 pencils are shared equally into 4 jars. Draw dots or use counters to find how many in each jar. Write the number sentence.

Q7. Mia found 4 shells. Ava found 3 times as many. How many shells did Ava find?

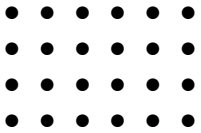


A bar model. Mia's bar is 4 long. Ava's bar is 3 lots of 4, making 12. The words '3 times as many' are under Ava's bar.

Q8. Pick × or ÷, then solve. (a) A tray holds 8 pies. The baker fills 5 trays. How many pies? (b) The baker puts 40 pies onto trays of 8. How many trays? (c) The baker shares 40 pies equally onto 5 trays. How many pies on each tray?

On your own

Q9. An array has 4 rows of 6 dots. Write two number sentences for it.



Q10. Split and multiply. (a) 15 × 4 (b) 23 × 3

Q11. Use 8 × 4 = 32 to find: (a) 32 ÷ 4 (b) 32 ÷ 8

Q12. Lara puts 12 eggs in each basket. She fills 3 baskets. How many eggs?

Q13. 42 oranges are packed into bags of 6. How many bags?

Q14. 23 biscuits are shared equally onto 5 plates. How many biscuits on each plate? How many are left over?

Q15. Make up a story that matches 6 × 8 = 48.

Q16. Tom read 6 pages of his book. His dad read 4 times as many pages. How many pages did his dad read?

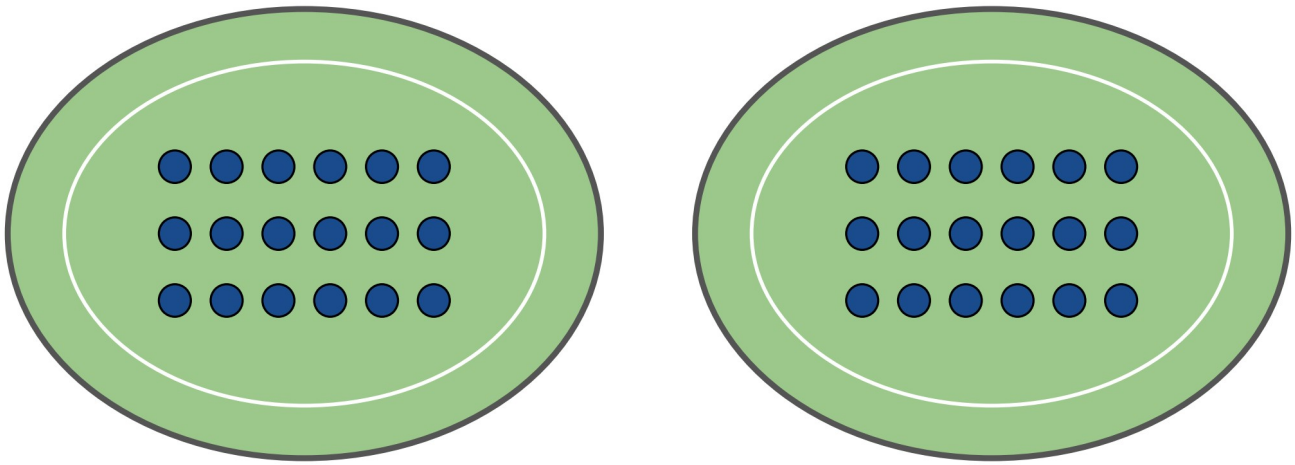
Q17. Leo says 6 × 7 = 41. Is he right? Show how splitting 7 into 5 and 2 checks it.

Q18. Fill in the missing number. (a) 7 × □ = 35 (b) □ ÷ 3 = 8 (c) 5 × □ = 45

Q19. In Australian Rules football, each team has 18 players on the field.

Source: Wikipedia, *Laws of Australian rules football*, retrieved 2026-08-20.

(a) Two teams play each other. How many players are on the field altogether?



2 × 18 = 36 players altogether

Two green ovals like footy fields, each with 18 player dots. Under them: 2 times 18 is 36 players altogether.

(b) One team warms up in rows of 3. How many rows?

(c) At training, each of the 18 players kicks 4 goals. How many goals is that for the team?

Answers

Q1. 5 × 3 = 15 and 3 × 5 = 15. **Q2.** (a) 3 × 6 = 18 (b) 18 ÷ 3 = 6 (c) 18 ÷ 6 = 3. **Q3.** (a) 5 (b) 5 (c) 9 (d) 9. **Q4.** 5, 10, 15, 20, 25, 30, 35; 7 × 5 = 35. **Q5.** 6 × 3 = 18; 30 + 18 = 48. **Q6.** 6 pencils; 24 ÷ 4 = 6. **Q7.** 12 shells. **Q8.** (a) 5 × 8 = 40 pies (b) 40 ÷ 8 = 5 trays (c) 40 ÷ 5 = 8 pies. **Q9.** 4 × 6 = 24 and 6 × 4 = 24. **Q10.** (a) 60 (b) 69. **Q11.** (a) 8 (b) 4. **Q12.** 36 eggs. **Q13.** 7 bags. **Q14.** 4 on each plate, 3 left over. **Q15.** Answers will be different. **Q16.** 24 pages. **Q17.** No — 6 × 7 = 42. **Q18.** (a) 5 (b) 24 (c) 9. **Q19.** (a) 36 players (b) 6 rows (c) 72 goals.

Worked answers

Q1. The array has 5 rows of 3, so 5 × 3 = 15. The same dots also make 3 lines of 5 going down, so 3 × 5 = 15.

Q2. (a) 3 groups of 6 is ×: 3 × 6 = 18. (b) Sharing 18 into 3 equal groups is 18 ÷ 3 = 6. (c) Making groups of 6 from 18 is 18 ÷ 6 = 3.

Q3. (a) 4 × 5 = 20 (b) 30 ÷ 5 = 6 (c) 9 × 2 = 18 (d) 45 ÷ 5 = 9.

Q4. 5, 10, 15, 20, 25, 30, 35 — seven fives, so 7 × 5 = 35.

Q5. 16 = 10 + 6. 10 × 3 = 30 and 6 × 3 = 18. 30 + 18 = 48, so 16 × 3 = 48.

Q6. 24 dots shared into 4 jars gives 6 in each jar: 24 ÷ 4 = 6.

Q7. Ava has 3 lots of 4: 3 × 4 = 12 shells.

Q8. (a) 5 groups of 8: 5 × 8 = 40 pies. (b) How many eights in 40: 40 ÷ 8 = 5 trays. (c) Share 40 into 5: 40 ÷ 5 = 8 pies on each tray.

Q9. 4 rows of 6 gives 4 × 6 = 24. The same dots make 6 lines of 4 going down, so 6 × 4 = 24.

Q10. (a) 15 = 10 + 5. 10 × 4 = 40 and 5 × 4 = 20. 40 + 20 = 60. (b) 23 = 20 + 3. 20 × 3 = 60 and 3 × 3 = 9. 60 + 9 = 69.

Q11. (a) 8 × 4 = 32, so 32 ÷ 4 = 8. (b) 32 ÷ 8 = 4.

Q12. 3 lots of 12: 12 × 3 = 36 eggs. (Or 3 × 10 = 30 and 3 × 2 = 6; 30 + 6 = 36.)

Q13. Ask: 6 times what makes 42? 6 × 7 = 42, so 42 ÷ 6 = 7 bags.

Q14. 5 × 4 = 20, and 23 − 20 = 3. So 4 biscuits on each plate, with 3 left over.

Q15. A story that works: *A box holds 8 chocolates. I buy 6 boxes. How many chocolates? 6 × 8 = 48.*

Q16. 4 times as many is ×: 6 × 4 = 24 pages.

Q17. Split 7 into 5 and 2. 6 × 5 = 30 and 6 × 2 = 12. 30 + 12 = 42, so 6 × 7 = 42, not 41. Leo is not right.

Q18. (a) 7 × 5 = 35 (b) 24 ÷ 3 = 8 (c) 5 × 9 = 45.

Q19. (a) 2 lots of 18: 2 × 18 = 36 players altogether. (b) How many threes in 18? 18 ÷ 3 = 6 rows. (c) 18 lots of 4: 18 × 4 = 72 goals. (Split it: 10 × 4 = 40 and 8 × 4 = 32; 40 + 32 = 72.)

Estimating quantities and judging whether an answer is reasonable

Code: VC2M3N06 (.E01, .E02, .E03, .E04)

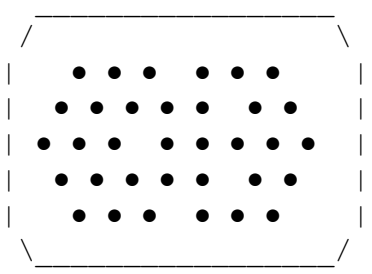
You already know how to count to find out exactly how many. Now you will learn a new skill: **estimating**. To **estimate** means to work out an answer that is close, without counting or working out exactly. An answer is **reasonable** if it is close to what you expect.

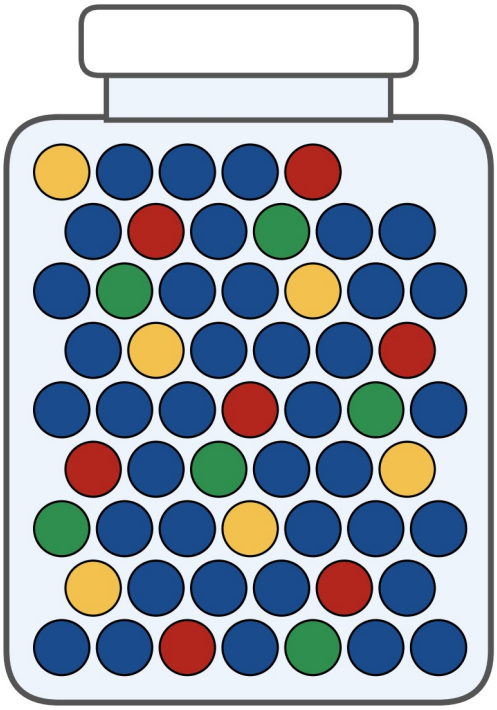
You will need: counters, grid paper and a pencil.

Learn about estimating

1. An estimate is a careful, close answer

Counting tells you exactly how many. But sometimes counting takes too long.



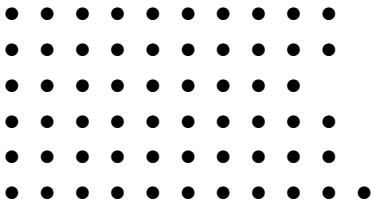


A jar full of many marbles.

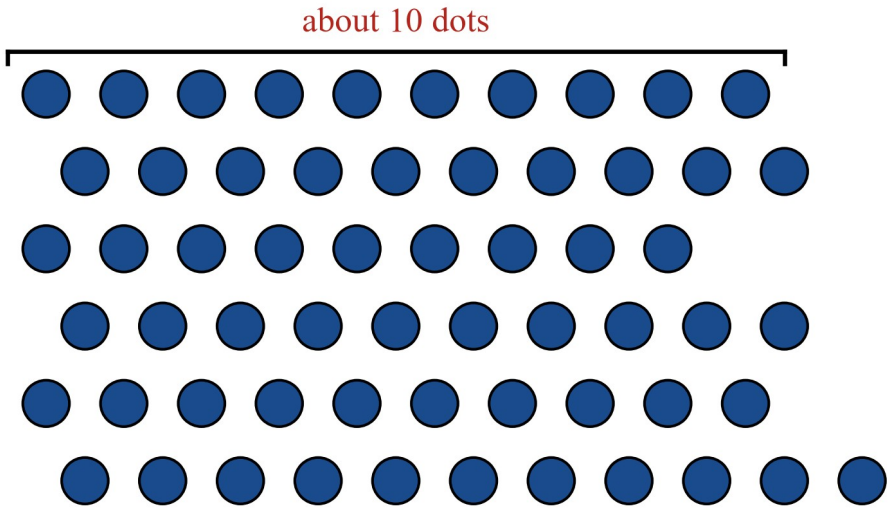
This jar is full of marbles. There are too many to count fast. Do not make a wild guess like 5 or 1 000. Make a careful estimate that is close to the real answer.

2. Use a part you know

Here is a good way to estimate a big collection. Find a small part you know, then count how many of those parts you can see.



one row has about 10 dots



Six rows of dots, with about 10 dots in each row. The top row has the words 'about 10 dots' over it.

Each row has about 10 dots. There are 6 rows. Count on by tens, one ten for each row:

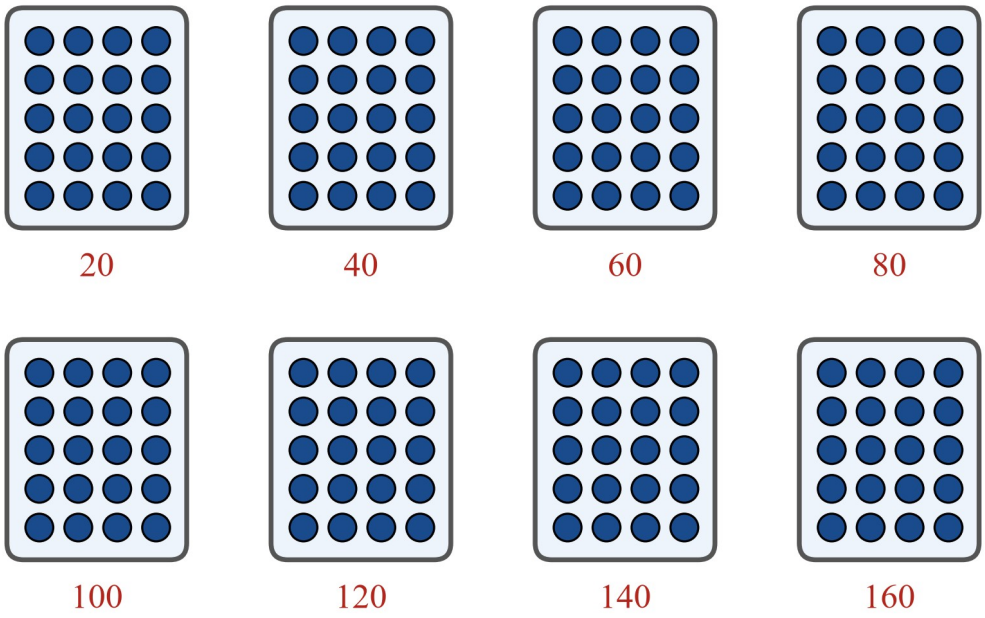
10, 20, 30, 40, 50, 60

There are about **60** dots.

You can do the same with people. Say your class has 20 students. The hall is full of classes like yours, and there is room for 8 classes. Count on by twenties:

20, 40, 60, 80, 100, 120, 140, 160

There are about **160** students at the assembly.



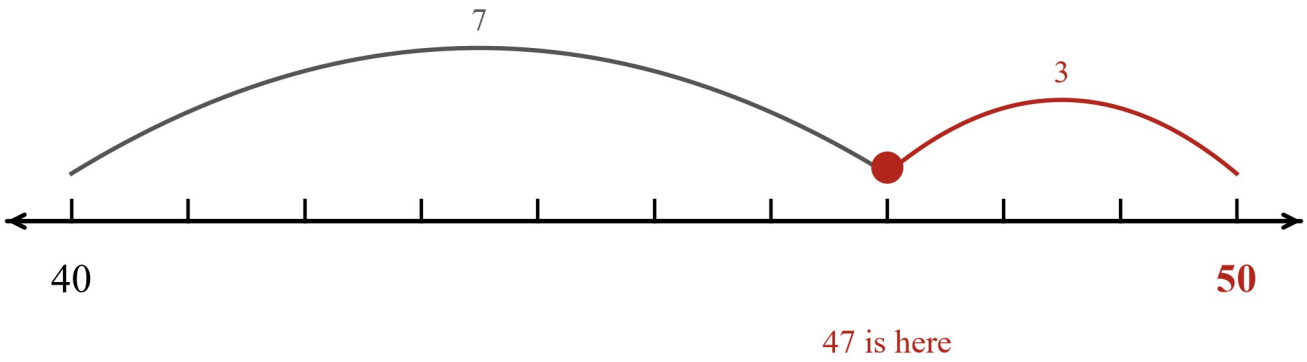
Eight groups of 20 dots. The counts under the groups are 20, 40, 60, 80, 100, 120, 140 and 160.

3. Round numbers to friendly numbers

Rounding turns a number into a friendly number that is close to it. Friendly numbers end in 0.

Which ten is 47 closer to — 40 or 50?

```
40   |----|----|----|----|----|----|----|----|----|----|   50
                                    47 is here
```

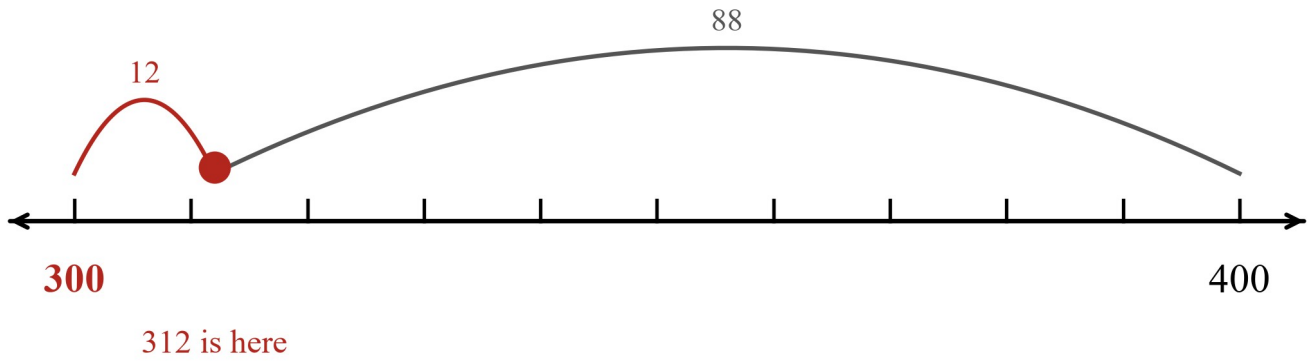


A number line from 40 to 50, with a dot on 47. 47 is closer to 50 than to 40.

47 is closer to 50, so 47 rounds to **50**.

Which hundred is 312 closer to — 300 or 400?

```
300   |----|----|----|----|----|----|----|----|----|----|   400
      312 is here
```



A number line from 300 to 400, with a dot on 312. 312 is closer to 300 than to 400.

312 is close to 300, so 312 rounds to **300**.

4. Pick the right rounding for the job

Small amounts round to the nearest ten. Big amounts round to the nearest hundred or the nearest thousand.

What you estimate	Round to
the spots on a ladybird	the nearest ten
the students at a school assembly	the nearest hundred
the people at a big football game	the nearest thousand

5. Estimate first, then work out

You can estimate the answer to a calculation before you work it out. Round each number first, then add the friendly numbers.

What is 187 + 392, about?

187 is close to 200. 392 is close to 400.

200 + 400 = 600

The estimate is **about 600**.

Now work out 187 + 392 = 579. 579 is close to 600, so 579 is a reasonable answer.

6. Use your estimate to check

Your estimate is a check on your working. If your answer is far from your estimate, stop and look at your working again.

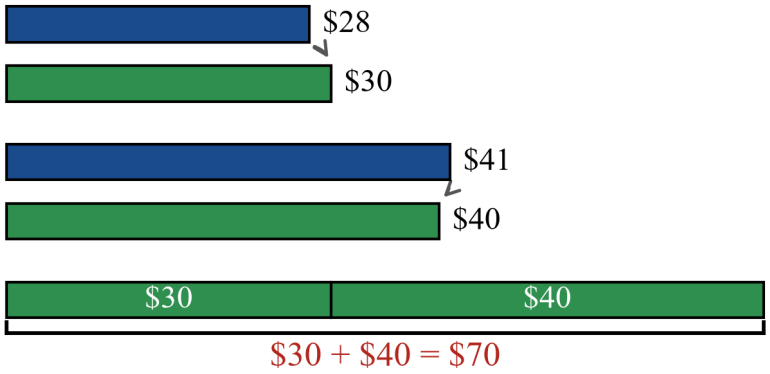
Estimating works with money too. A toy costs $28 and a book costs $41. Is $65 enough?

Round each price to the nearest ten dollars: $28 rounds to $30, and $41 rounds to $40.

30 + 40 = 70

The estimate is about $70. $65 is less than $70, so $65 is probably not enough. Check: $28 + $41 = $69. $65 is not enough.

round first, then add

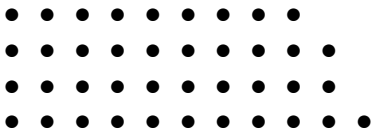


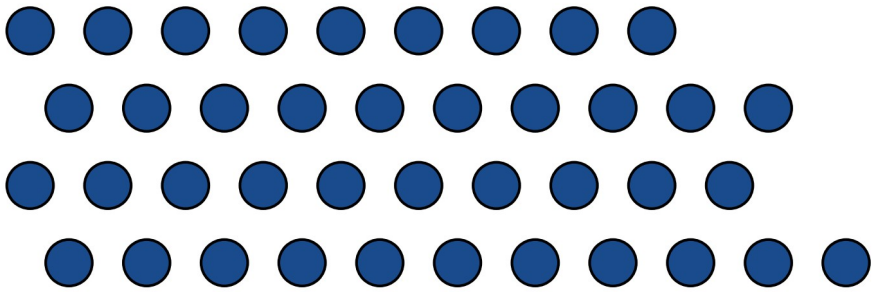
A bar model for $28 and $41. $28 rounds to $30 and $41 rounds to $40. $30 + $40 = $70.

Worked examples

Example 1 — with help

Estimate the number of dots.





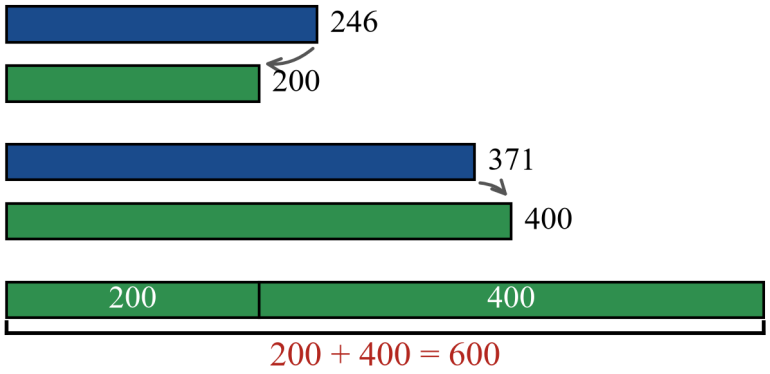
Four rows of dots, with about 10 dots in each row.

Working	What we did
One row has about 10 dots.	Found a part we know.
There are 4 rows.	Counted the rows.
10, 20, 30, 40	Counted on by tens, one ten for each row.
There are about 40 dots. ✓	Gave the estimate.

Example 2 — with help

Round each number to the nearest hundred to estimate 246 + 371. Is 617 a reasonable answer?

round first, then add



A bar model for 246 + 371. 246 rounds to 200 and 371 rounds to 400. 200 + 400 = 600.

Working	What we did
246 rounds to 200.	246 is closer to 200 than to 300.
371 rounds to 400.	371 is closer to 400 than to 300.
200 + 400 = 600	Added the friendly numbers. The estimate is 600.
617 is close to 600, so it is reasonable. ✓	Compared the answer with the estimate.

Example 3 — on your own

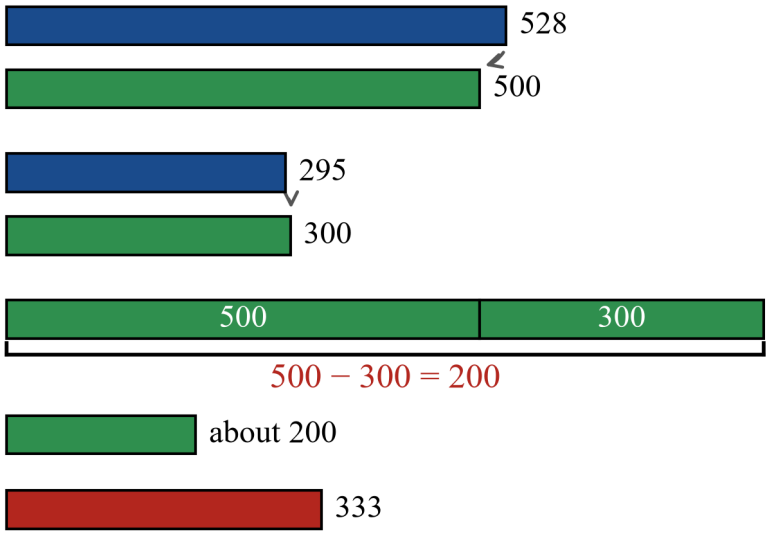
Ben says 528 − 295 = 333. Is his answer reasonable?

Round to the nearest hundred: 528 is close to 500, and 295 is close to 300.

500 − 300 = 200

The estimate is about 200. 333 is not close to 200, so Ben's answer is **not reasonable**. (The correct answer is 528 − 295 = 233, and 233 is close to 200. ✓)

round first, then take away

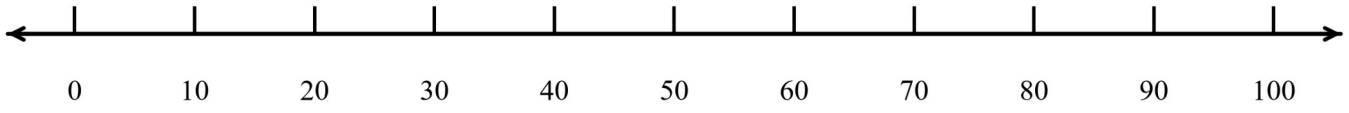


A bar model for 528 − 295. 528 rounds to 500 and 295 rounds to 300, so the answer is about 200. The answer 333 is far from 200.

Practice questions

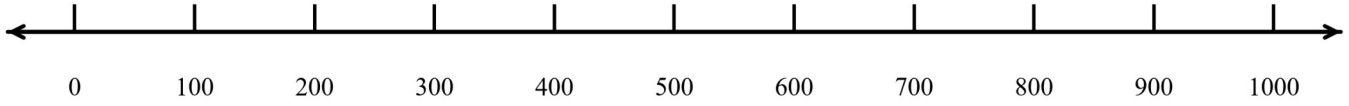
With help

Q1. Which ten is each number closer to? (a) 32 (b) 68 (c) 41 (d) 97



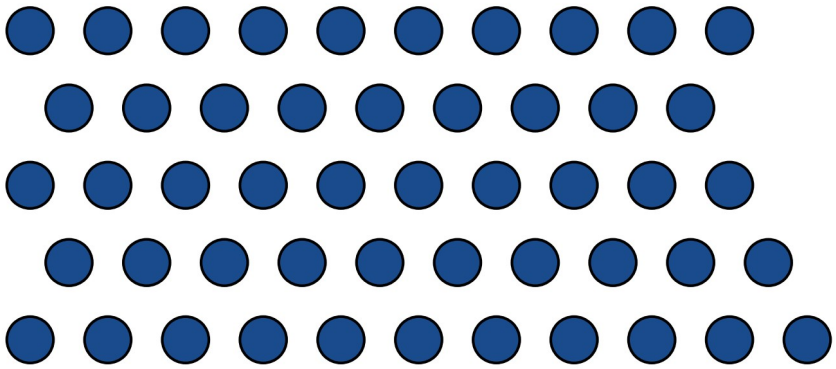
A number line from 0 to 100, with a label at every ten.

Q2. Which hundred is each number closer to? (a) 129 (b) 472 (c) 851 (d) 305



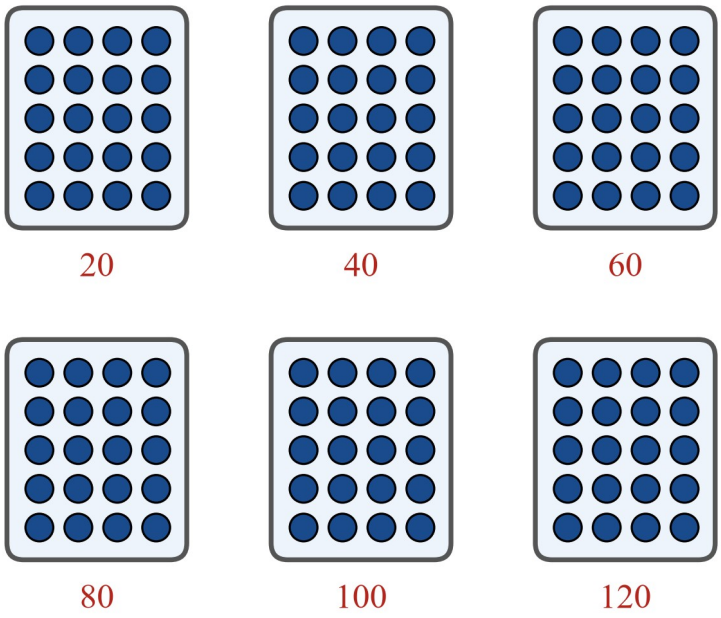
A number line from 0 to 1000, with a label at every hundred.

Q3. Each row has about 10 dots. There are 5 rows. Estimate how many dots there are in all.



Five rows of dots, with about 10 dots in each row.

Q4. At a school assembly, 6 classes sit in the hall. Each class has about 20 students. Count on by twenties to estimate how many students are in the hall.



Six groups of 20 dots. The counts under the groups are 20, 40, 60, 80, 100 and 120.

Q5. Round 46 and 31 to the nearest ten. Then estimate 46 + 31.

Q6. Round 287 and 412 to the nearest hundred. Then estimate 287 + 412.

Q7. Would you round to the nearest ten, the nearest hundred, or the nearest thousand? (a) the spots on a ladybird (b) the people at a big football game (c) the classes at our school

Q8. A pencil case costs $19 and a notebook costs $12. Round each price to the nearest ten dollars and estimate the total. Is $40 enough?

On your own

Q9. Round each number to the nearest ten: (a) 73 (b) 58 (c) 21

Q10. Round each number to the nearest hundred: (a) 264 (b) 739 (c) 451

Q11. A jar has buttons in 4 layers. Each layer has about 20 buttons. Estimate how many buttons are in the jar.

Q12. Round each number to the nearest hundred and estimate 156 + 331. Then work out 156 + 331. Is your answer reasonable?

Q13. Round each number to the nearest ten and estimate 78 − 33.

Q14. Mia says 254 + 176 = 330. Estimate to check her answer. Is 330 reasonable?

Q15. Round each number to the nearest hundred: (a) 912 (b) 996

Q16. 4 367 people went to watch the football. Round the crowd to the nearest thousand.

Q17. Ava has $50. She wants a doll that costs $28 and a book that costs $17. Estimate to find out if she has enough money. Then check with exact addition.

Q18. Each page of grid paper holds 100 small squares. Sam wants to show the number 20 200 as squares on the wall, one page at a time.

(a) How many pages will he need? (Hint: how many hundreds are in 20 200?)

(b) Round your answer to the nearest hundred to estimate.

Q19. The Melbourne Cricket Ground (MCG) in Melbourne can hold 100 024 people. At the 2023 football Grand Final, 100 024 people came — every seat was full.

Source: Wikipedia, *Melbourne Cricket Ground*, opened 2026-08-19.

(a) Round 100 024 to the nearest hundred.

(b) Round 100 024 to the nearest thousand.

(c) The news said, “About 100 000 people went to the Grand Final.” Is this estimate reasonable? Why?

Answers

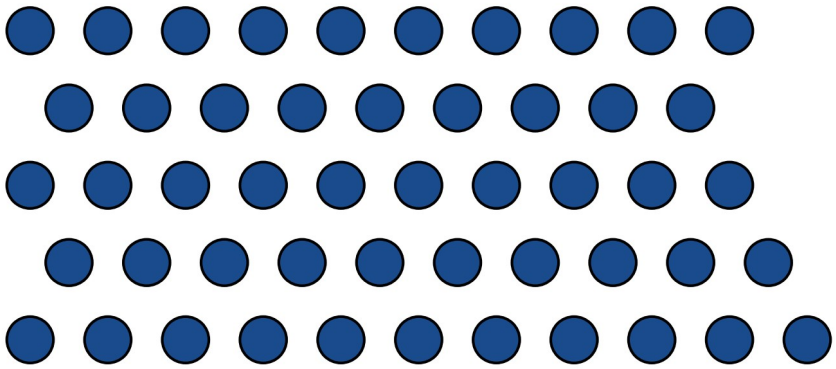
Q1. (a) 30 (b) 70 (c) 40 (d) 100. **Q2.** (a) 100 (b) 500 (c) 900 (d) 300. **Q3.** About 50 dots. **Q4.** About 120 students. **Q5.** 50 and 30; about 80. **Q6.** 300 and 400; about 700. **Q7.** (a) nearest ten (b) nearest thousand (c) nearest ten. **Q8.** $20 + $10 = $30; yes, $40 is enough. **Q9.** (a) 70 (b) 60 (c) 20. **Q10.** (a) 300 (b) 700 (c) 500. **Q11.** About 80 buttons. **Q12.** Estimate 500; 156 + 331 = 487; yes, 487 is close to 500. **Q13.** 80 − 30 = 50. **Q14.** Estimate 300 + 200 = 500; 330 is not close to 500, so it is not reasonable. **Q15.** (a) 900 (b) 1 000. **Q16.** 4 000. **Q17.** Estimate $30 + $20 = $50; exact $28 + $17 = $45; yes, she has enough. **Q18.** (a) 202 pages (b) about 200 pages. **Q19.** (a) 100 000 (b) 100 000 (c) yes — 100 024 rounds to 100 000, so the news number is close to the real number.

Worked answers

Q1. 32 is closer to 30. 68 is closer to 70. 41 is closer to 40. 97 is closer to 100.

Q2. 129 is closer to 100. 472 is closer to 500. 851 is closer to 900. 305 is closer to 300.

Q3. One row has about 10 dots, and there are 5 rows: 10, 20, 30, 40, 50. About 50 dots.



Five rows of dots, with about 10 dots in each row.

Q4. Count on by twenties for 6 classes: 20, 40, 60, 80, 100, 120. About 120 students.

Q5. 46 rounds to 50, and 31 rounds to 30. 50 + 30 = 80, so 46 + 31 is about 80. (Check: 46 + 31 = 77, and 77 is close to 80. ✓)

Q6. 287 rounds to 300, and 412 rounds to 400. 300 + 400 = 700, so 287 + 412 is about 700. (Check: 287 + 412 = 699, and 699 is close to 700. ✓)

Q7. (a) A ladybird has a small number of spots, so round to the nearest ten. (b) A big football game has a huge crowd, so round to the nearest thousand. (c) A school has only some classes, so round to the nearest ten.

Q8. $19 rounds to $20 and $12 rounds to $10. $20 + $10 = $30. $40 is more than $30, so $40 is enough. (Check: $19 + $12 = $31. ✓)

Q9. 73 is closer to 70. 58 is closer to 60. 21 is closer to 20.

Q10. 264 is closer to 300. 739 is closer to 700. 451 is closer to 500.

Q11. One layer has about 20 buttons, and there are 4 layers: 20, 40, 60, 80. About 80 buttons.

Q12. 156 rounds to 200 and 331 rounds to 300. 200 + 300 = 500, so the estimate is 500. Now 156 + 331 = 487. 487 is close to 500, so the answer is reasonable. ✓

Q13. 78 rounds to 80 and 33 rounds to 30. 80 − 30 = 50, so 78 − 33 is about 50. (Check: 78 − 33 = 45, and 45 is close to 50. ✓)

Q14. 254 rounds to 300 and 176 rounds to 200. 300 + 200 = 500, so the estimate is 500. 330 is far from 500, so 330 is not reasonable. (254 + 176 = 430, and 430 is close to 500. ✓)

Q15. 912 is closer to 900. 996 is closer to 1 000.

Q16. 4 367 is closer to 4 000 than to 5 000, so the crowd is about 4 000.

Q17. $28 rounds to $30 and $17 rounds to $20. $30 + $20 = $50. Ava has $50, so she probably has enough. Check: $28 + $17 = $45, and $45 is less than $50. Yes, she has enough ($5 left). ✓

Q18. (a) 20 200 is 202 hundreds (20 200 = 202 × 100), so Sam needs 202 pages. (b) 202 rounds to 200, so that is about 200 pages.

Q19. (a) 100 024 is closer to 100 000 than to 100 100, so it rounds to 100 000. (b) 100 024 is closer to 100 000 than to 101 000, so it rounds to 100 000. (c) Yes. 100 024 rounds to 100 000 to the nearest hundred and to the nearest thousand, so “about 100 000” is close to the real number and is a reasonable estimate.

Algorithms that investigate numbers

Code: VC2M3N09 (.E01, .E02, .E03, .E04)

An **algorithm** is a set of steps to follow to get a job done. In this topic you will follow flow charts that test numbers, make your own set of steps for a friend to follow, sort coins, and look for patterns that pop out along the way.

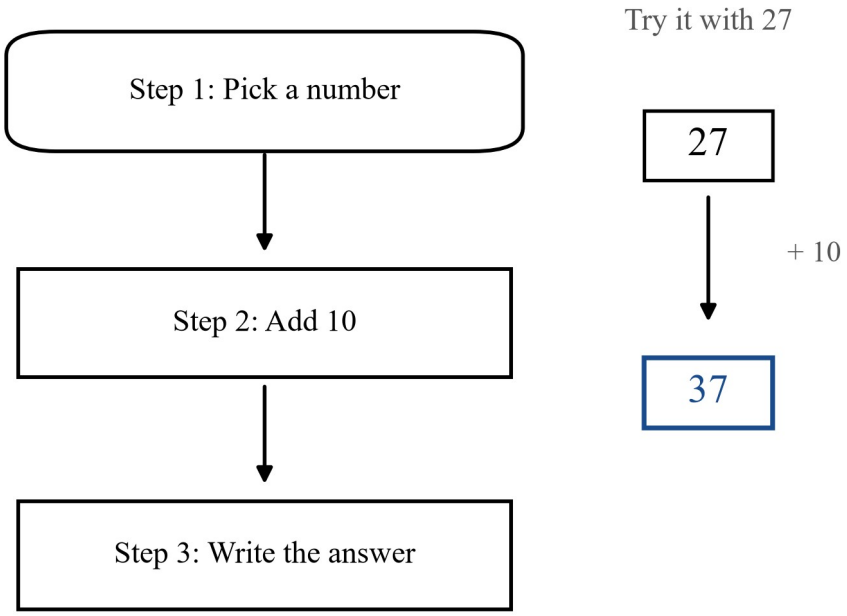
You will need: counters, grid paper, some 5-cent and 10-cent coins and a pencil.

Learn about algorithms

1. An algorithm is a set of steps

You already follow steps every day. A recipe tells you what to do first, what to do next and what to do last. The rules of a game tell you what to do. An algorithm works the same way: it is a set of steps, in order.

Here is an algorithm for numbers.



Three step boxes with arrows going down. Step 1: Pick a number. Step 2: Add 10. Step 3: Write the answer. On the right, 27 goes in and 37 comes out.

Step 1: Pick a number. Step 2: Add 10. Step 3: Write the answer.

Try it with 27. Add 10 to 27 to get 37. The algorithm turns 27 into 37.

The order of the steps is important. Change the order, and you can get a different answer.

> An **algorithm** is a set of steps to follow, in order, to get a job done.

2. Some steps ask a question

Some steps in an algorithm ask a question. The answer to the question tells you where to go next.

A **flow chart** shows an algorithm as a picture with boxes and arrows. Boxes hold the steps. Arrows show the way to go. A diamond shape holds a question, and each answer has its own arrow out — one for yes and one for no.

A flow chart uses boxes, arrows and a diamond to show the steps of an algorithm. The diamond asks a question with a yes way and a no way.

3. Is the number a multiple of 2, 5 or 10?

Skip counting finds multiples.

Count on by 2s: 2, 4, 6, 8, 10, 12, … These are the **multiples of 2** — the even numbers you met in 1A.

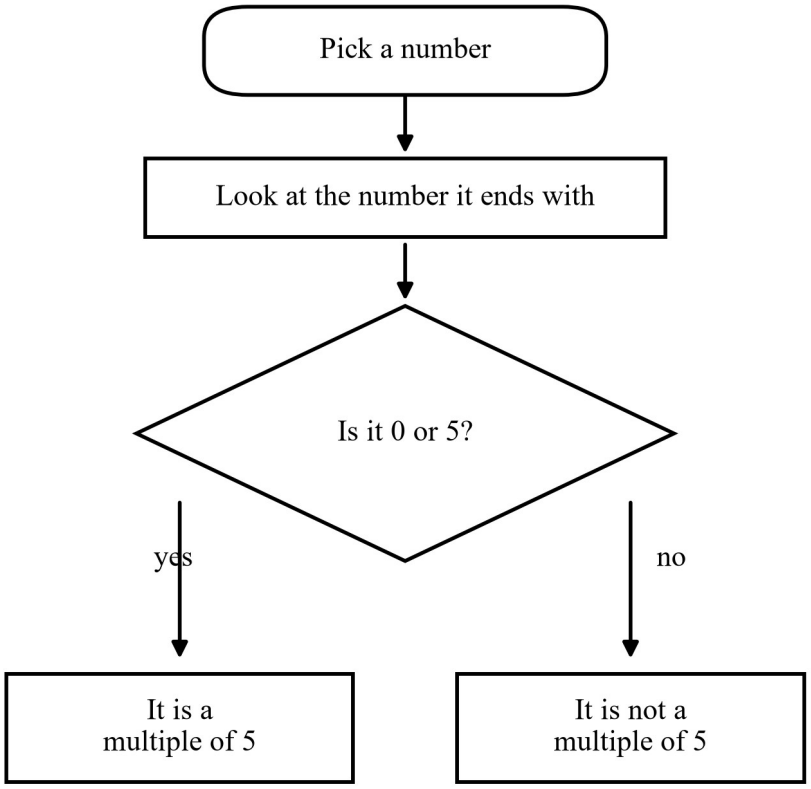
Count on by 5s: 5, 10, 15, 20, 25, 30, … These are the **multiples of 5**.

Count on by 10s: 10, 20, 30, 40, 50, … These are the **multiples of 10**.

You can test any number without counting. Just look at the number it ends with.

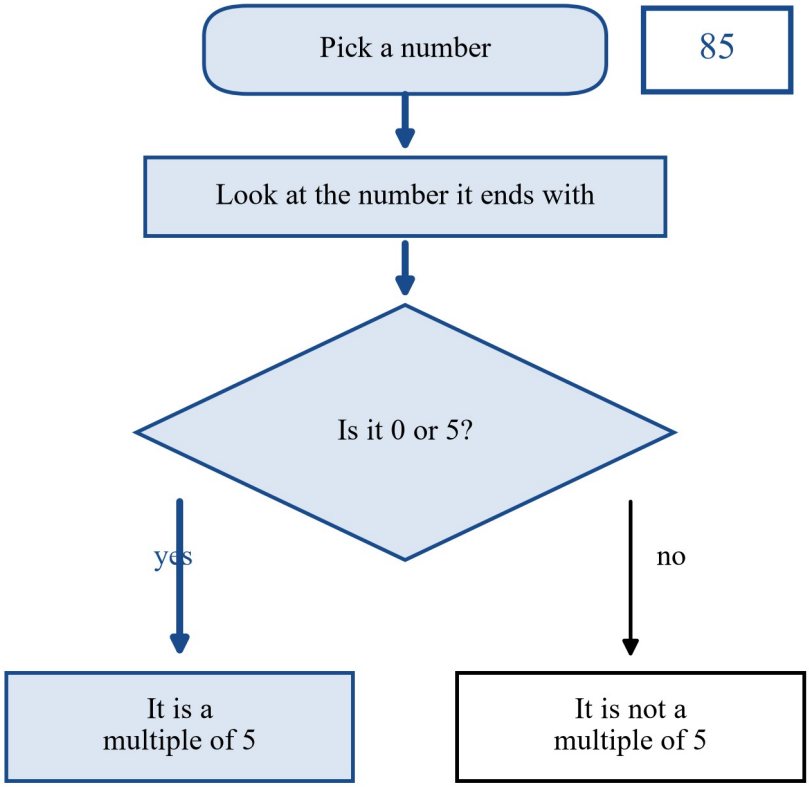
Multiple of …	The number ends with …
2	0, 2, 4, 6 or 8
5	0 or 5
10	0

Here is a flow chart that tests if a number is a multiple of 5.



A flow chart. Pick a number, look at the number it ends with, then answer the question: is it 0 or 5? Yes means the number is a multiple of 5. No means it is not a multiple of 5.

Let us try 85.



85 ends in 5. 5 is one of 0 or 5, so 85 is a multiple of 5.

The same flow chart with the path for 85 in blue. 85 ends in 5, and 5 is one of 0 or 5, so 85 is a multiple of 5.

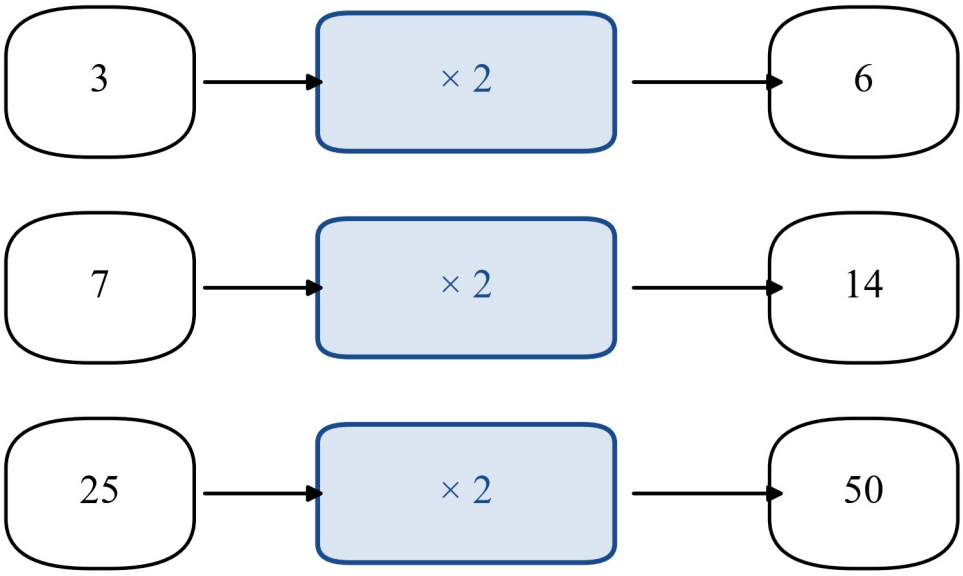
- Start with 85.
- Look at the number it ends with. It is 5.
- Is 5 one of 0 or 5? Yes.
- So 85 is a **multiple of 5**.

Notice this: every number that ends in 0 ends in 0 or 5 too. So every multiple of 10 is also a multiple of 5. And numbers that end in 0 are even, so every multiple of 10 is a multiple of 2 as well.

4. A doubling machine

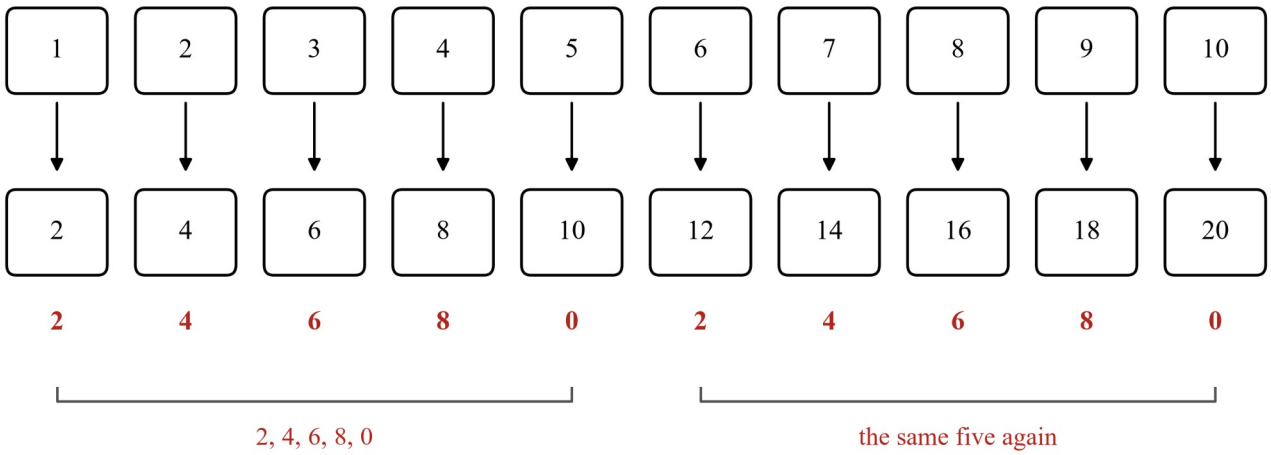
To **double** a number, add the number to itself. Double 7 is 7 + 7 = 14.

A doubling machine doubles every number that goes in.



A doubling machine with a blue box in the middle. 3 goes in and 6 comes out. 7 goes in and 14 comes out. 25 goes in and 50 comes out.

Run the machine on the numbers 1 to 10. The answers come out: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20.



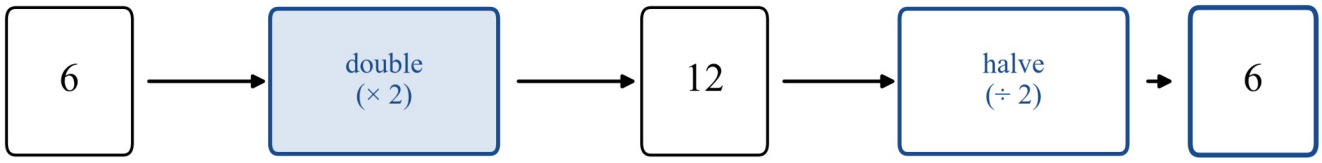
Two rows of number cards. The top row is 1 to 10 going in. The bottom row is 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 coming out. The last numbers 2, 4, 6, 8, 0 are in red, and they repeat.

Look at the number each answer ends with: 2, 4, 6, 8, 0 — then the same five numbers again! A pattern has popped out. All the answers are even numbers.

5. Double, then halve — back where you started

To **halve** a number, share it into 2 equal parts. Half of 12 is 6, because 6 + 6 = 12.

What happens if you double a number, then halve the answer?



back where you started!

A trip there and back. 6 goes into a doubling machine and 12 comes out. Then 12 goes into a halving machine and 6 comes out, back where it started.

Start with 6. Double it: 6 + 6 = 12. Now halve 12: half of 12 is 6. You are back where you started!

Try 9. Double 9: 9 + 9 = 18. Halve 18: 9 + 9 = 18, so half of 18 is 9. Back where you started again.

> Halving undoes doubling. Double a number, then halve the answer, and you get the number you started with.

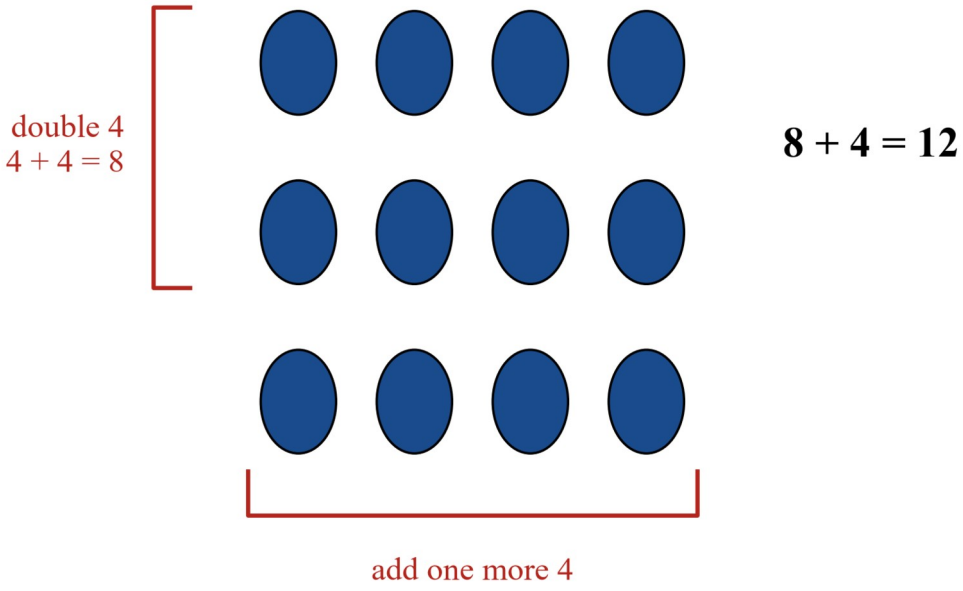
6. Make your own algorithm

You can write your own algorithm for a friend to follow. Make each step clear, and put the steps in order.

Here is a rule for finding 3 times a number.

> To find 3 times a number: double the number, then add on one more of the number.

Why does it work? 3 times a number is 2 lots of the number and 1 more lot. Doubling gives you 2 lots. Then you add on 1 more lot.



Two groups of four dots, then one more group of four dots. Under the first two groups the words say double 4 is 8. Under the last group the words say add one more 4. In all, 8 + 4 = 12.

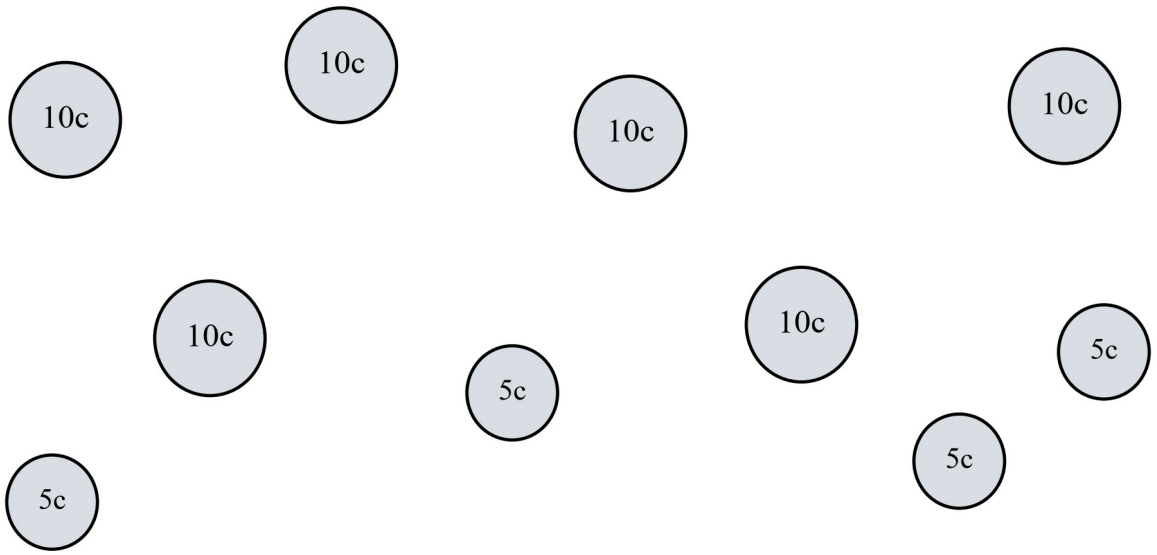
Use the rule to find 3 × 4. Double 4: 4 + 4 = 8. Add on one more 4: 8 + 4 = 12. So 3 × 4 = 12.

7. A sorting algorithm

An algorithm can sort things into groups. Here is one that sorts coins.

Australian 10-cent coins are big, and Australian 5-cent coins are small.

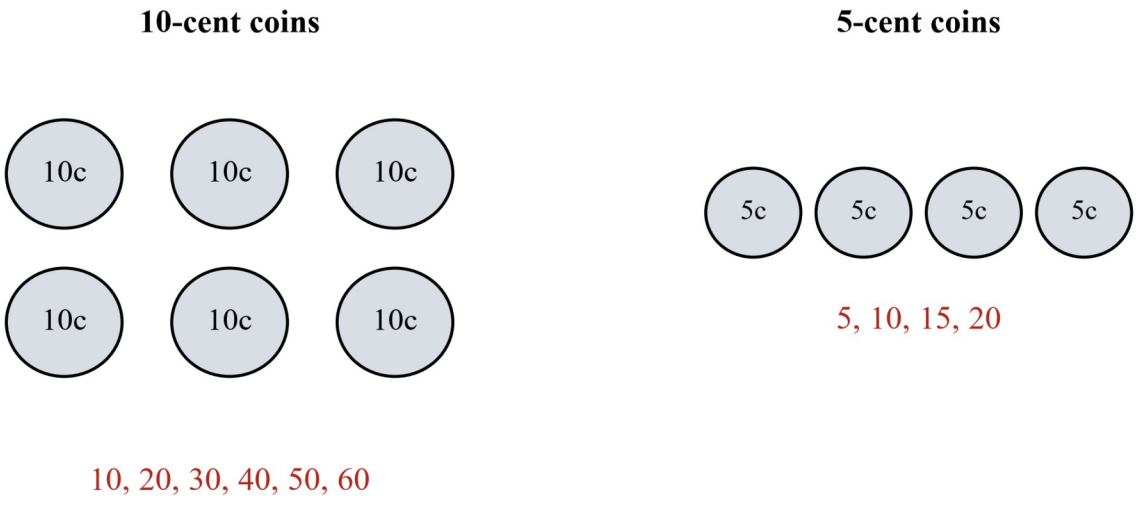
Here is a mixed pile of coins.



A mixed pile of coins: six big 10-cent coins and four small 5-cent coins.

Sort them with this algorithm.

Step 1: Look at each coin. Step 2: Big coin? Put it in the 10-cent pile. Small coin? Put it in the 5-cent pile. Step 3: Count the 10-cent pile by 10s. Step 4: Count the 5-cent pile by 5s. Step 5: Add the two totals.



Two sorted piles of coins. The left pile has six 10-cent coins, counted 10, 20, 30, 40, 50, 60. The right pile has four 5-cent coins, counted 5, 10, 15, 20. Under the piles, the words say 60 + 20 = 80 cents.

Six 10-cent coins: 10, 20, 30, 40, 50, 60 — that is 60 cents.

Four 5-cent coins: 5, 10, 15, 20 — that is 20 cents.

All together: 60 + 20 = 80 cents.

Worked examples

Example 1 — with help

Is 70 a multiple of 2? A multiple of 5? A multiple of 10?

Working	What we did
70 ends in 0.	Looked at the number it ends with.
0 is one of 0, 2, 4, 6, 8. So 70 is a multiple of 2.	Tested for 2.
0 is one of 0 or 5. So 70 is a multiple of 5.	Tested for 5.
0 is 0. So 70 is a multiple of 10.	Tested for 10.
70 is a multiple of 2, 5 and 10. ✓	Gave the answer.

Every number that ends in 0 is a multiple of 2, of 5 and of 10.

Example 2 — with help

Start with 16. Double it, then halve the answer. What do you get?

Working	What we did
Double 16: 16 + 16 = 32	Doubled first.
Half of 32 is 16, because 16 + 16 = 32.	Halved the answer.

Working	What we did
We are back at 16. ✓	Halving undoes doubling.

Example 3 — on your own

Mia uses the rule to find 3 × 7: double the number, then add on one more of the number. What answer does she get?

Double 7: 7 + 7 = 14. Add on one more 7: 14 + 7 = 21.

Mia gets 21, so 3 × 7 = 21. ✓

Check: 7 + 7 + 7 = 21. ✓

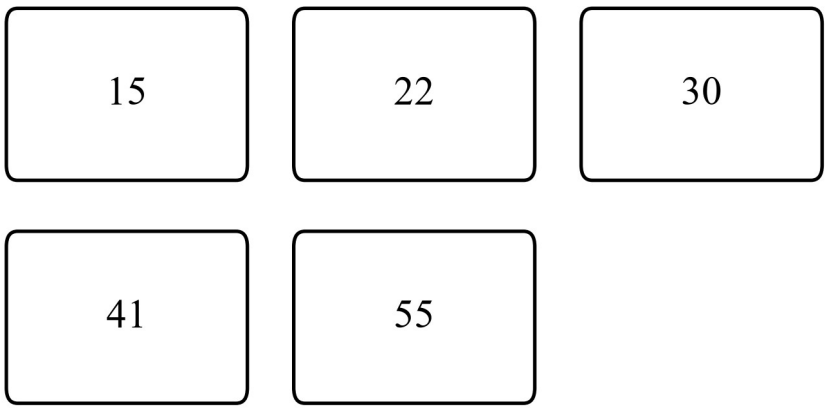
Practice questions

With help

Q1. Follow this algorithm. Step 1: Pick a number. Step 2: Add 10. Step 3: Write the answer. Start with 46. What answer do you get?

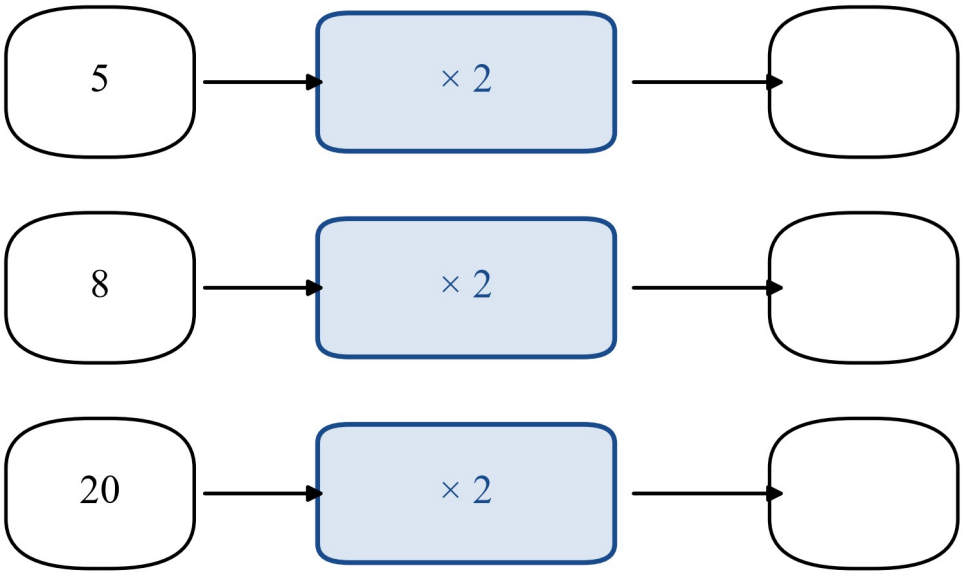
Q2. Use the flow chart to test 40. What number does 40 end with? Is 40 a multiple of 5?

Q3. Circle the multiples of 5.



Five number cards: 15, 22, 30, 41 and 55.

Q4. The doubling machine doubles every number that goes in. What comes out? (a) 5 goes in (b) 8 goes in (c) 20 goes in



A doubling machine with a blue box in the middle. 5 goes in and a blank comes out. 8 goes in and a blank comes out. 20 goes in and a blank comes out.

Q5. Double each number, then halve the answer. (a) Start with 7. (b) Start with 11. What do you notice?

Q6. Fill in the blanks. (a) A multiple of 10 always ends in **. (b) The multiples of 2 are the** numbers.

Q7. Use the rule to find 3 × 5: double the number, then add on one more of the number.

Q8. A jar has 4 ten-cent coins and 3 five-cent coins.

(a) Count the ten-cent coins by 10s. How many cents are they?

(b) Count the five-cent coins by 5s. How many cents are they?

(c) What is the total value of all the coins?

On your own

Q9. Is each number a multiple of 2? (a) 34 (b) 57 (c) 90 (d) 116

Q10. Is each number a multiple of 5? (a) 25 (b) 42 (c) 70 (d) 105

Q11. Fill in the missing numbers. (a) 10, 20, **,** , 50 (b) 5, 10, **, 20,**

Q12. The doubling machine. What comes out? (a) 12 goes in (b) 16 goes in (c) 30 goes in

Q13. Double each number, then halve the answer. (a) Start with 15. (b) Start with 25. What do you get each time?

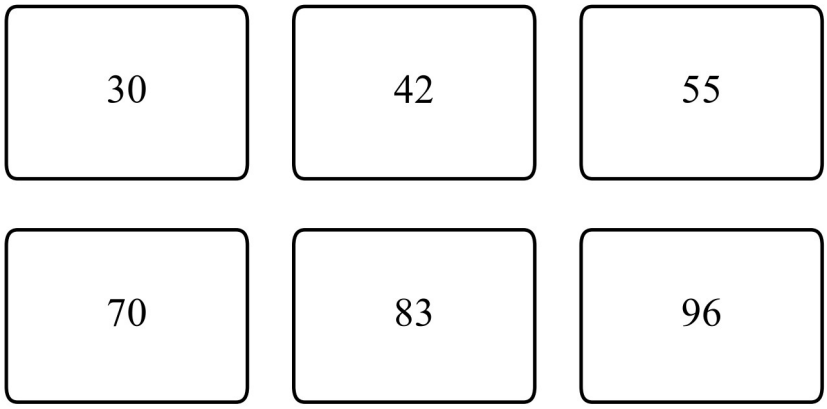
Q14. Use the rule to find: (a) 3 × 6 (b) 3 × 9

Q15. Write the steps of an algorithm that decides if a number is a multiple of 10. (Hint: look at the number it ends with.)

Q16. True or false: every multiple of 10 is also a multiple of 5. Explain how you know.

Q17. Ben says, “If a number ends in 5, it is a multiple of 10.” Is Ben right? Give a number that shows why or why not.

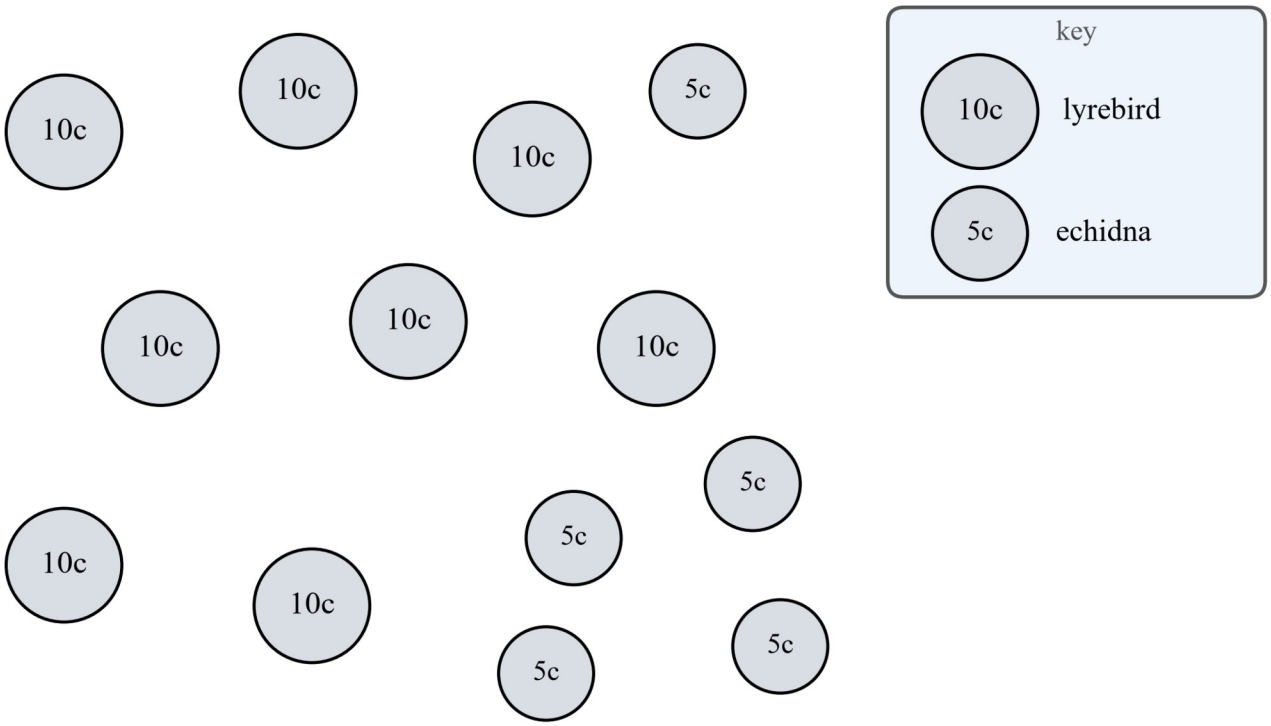
Q18. Sort these number cards into three groups: multiples of 2, multiples of 5, and multiples of 10. Some cards go in more than one group.



Six number cards: 30, 42, 55, 70, 83 and 96.

Q19. A Grade 3 class is collecting coins for the school fete. Their jar has 8 ten-cent coins and 5 five-cent coins. The big 10-cent coin shows a lyrebird, and the small 5-cent coin shows an echidna.

Source: Wikipedia, *Australian five-cent coin*, *Australian ten-cent coin*, retrieved 2026-08-20.



A mixed pile of coins, with a key. The key shows a big coin with the words 10c lyrebird and a small coin with the words 5c echidna.

(a) Write the steps of a sorting algorithm the class can use to sort the coins into two piles.

(b) Count the lyrebird coins by 10s. How many cents are they?

(c) Count the echidna coins by 5s. How many cents are they?

(d) What is the total value of all the coins? Is the total a multiple of 10? Is it a multiple of 5? How do you know?

Answers

Q1. 56. **Q2.** 40 ends in 0; 0 is one of 0 or 5, so yes — 40 is a multiple of 5. **Q3.** 15, 30 and 55. **Q4.** (a) 10 (b) 16 (c) 40. **Q5.** (a) 7 (b) 11; you get back the number you started with. **Q6.** (a) 0 (b) even. **Q7.** Double 5 is 10; 10 + 5 = 15. **Q8.** (a) 40 cents (b) 15 cents (c) 55 cents. **Q9.** (a) yes (b) no (c) yes (d) yes. **Q10.** (a) yes (b) no (c) yes (d) yes. **Q11.** (a) 30 and 40 (b) 15 and 25. **Q12.** (a) 24 (b) 32 (c) 60. **Q13.** (a) 15 (b) 25; you get back the number you started with. **Q14.** (a) 18 (b) 27. **Q15.** Step 1: Look at the number it ends with. Step 2: Is it 0? Step 3: Yes — the number is a multiple of 10. No — it is not. **Q16.** True; every multiple of 10 ends in 0, and 0 is one of 0 or 5. **Q17.** No; 15 ends in 5 but is not a multiple of 10. A multiple of 10 must end in 0. **Q18.** Multiples of 2: 30, 42, 70 and 96. Multiples of 5: 30, 55 and 70. Multiples of 10: 30 and 70. **Q19.** (a) Steps: look at each coin; big coins go in the 10-cent pile; small coins go in the 5-cent pile; count each pile (b) 80 cents (c) 25 cents (d) 105 cents; it ends in 5, so it is a multiple of 5, not a multiple of 10.

Worked answers

Q1. Start with 46. Add 10: 46 + 10 = 56. The answer is 56.

Q2. 40 ends in 0. 0 is one of 0 or 5, so yes — 40 is a multiple of 5.

Q3. Multiples of 5 end in 0 or 5. 15, 30 and 55 end in 0 or 5, so they are multiples of 5. 22 and 41 are not.

Q4. The machine doubles each number. (a) 5 + 5 = 10. (b) 8 + 8 = 16. (c) 20 + 20 = 40.

Q5. (a) Double 7 is 14; half of 14 is 7. (b) Double 11 is 22; half of 22 is 11. Each time, you get back the number you started with.

Q6. (a) A multiple of 10 always ends in 0. (b) The multiples of 2 are the even numbers.

Q7. Double 5: 5 + 5 = 10. Add on one more 5: 10 + 5 = 15. So 3 × 5 = 15.

Q8. (a) Count the 4 ten-cent coins by 10s: 10, 20, 30, 40 — that is 40 cents. (b) Count the 3 five-cent coins by 5s: 5, 10, 15 — that is 15 cents. (c) All together: 40 + 15 = 55 cents.

Q9. Multiples of 2 end in 0, 2, 4, 6 or 8. (a) 34 ends in 4, so yes. (b) 57 ends in 7, so no. (c) 90 ends in 0, so yes. (d) 116 ends in 6, so yes.

Q10. Multiples of 5 end in 0 or 5. (a) 25 ends in 5, so yes. (b) 42 ends in 2, so no. (c) 70 ends in 0, so yes. (d) 105 ends in 5, so yes.

Q11. (a) Counting on by 10s: 10, 20, 30, 40, 50 — the missing numbers are 30 and 40. (b) Counting on by 5s: 5, 10, 15, 20, 25 — the missing numbers are 15 and 25.

Q12. (a) 12 + 12 = 24. (b) 16 + 16 = 32. (c) 30 + 30 = 60.

Q13. (a) Double 15 is 30; half of 30 is 15. (b) Double 25 is 50; half of 50 is 25. Each time you get back the number you started with, because halving undoes doubling.

Q14. (a) Double 6 is 12; 12 + 6 = 18, so 3 × 6 = 18. (b) Double 9 is 18; 18 + 9 = 27, so 3 × 9 = 27.

Q15. Step 1: Look at the number the number ends with. Step 2: Is it 0? Step 3: Yes — the number is a multiple of 10. No — it is not a multiple of 10.

Q16. True. Every multiple of 10 ends in 0. 0 is one of 0 or 5, so every multiple of 10 is also a multiple of 5.

Q17. Ben is not right. 15 ends in 5, but 15 is a multiple of 5, not a multiple of 10. A multiple of 10 must end in 0.

Q18. Multiples of 2 end in 0, 2, 4, 6 or 8: 30, 42, 70 and 96. Multiples of 5 end in 0 or 5: 30, 55 and 70. Multiples of 10 end in 0: 30 and 70.

Q19. (a) Steps: look at each coin; big lyrebird coins go in the 10-cent pile; small echidna coins go in the 5-cent pile; count the 10-cent pile by 10s; count the 5-cent pile by 5s; add the two totals. (b) The 8 lyrebird coins: 10, 20, 30, 40,

50, 60, 70, 80 — that is 80 cents. (c) The 5 echidna coins: 5, 10, 15, 20, 25 — that is 25 cents. (d) All together: 80 + 25 = 105 cents. 105 ends in 5, so it is a multiple of 5, not a multiple of 10.

Test

Test T1 · Chapter 1 — Number: whole numbers and the four operations

Mathematics Level 3 (Year 3) · Victorian Curriculum 2.0

Codes assessed: VC2M3N01 · VC2M3N02 · VC2M3N04 · VC2M3N05 · VC2M3N06 · VC2M3N09

Name: _____ Date: _____

Total marks	25
Guidance duration	30 minutes
Timing	This is a classroom check, not an exam. There is no strict time limit. Your teacher will let you finish.
Equipment	You may use counters, base-ten blocks, a number line, a place-value chart and a pencil.
Calculators	Question 3 must be done **without a calculator**. The content description VC2M3N04 says this adding and subtracting is done "without a calculator". For the other questions the curriculum allows a calculator, but you do not need one.

Attempt every question. Show your working where the question asks for it.

Question 1 — Odd and even numbers (4 marks)

(a) Which number is odd? (1 mark)

A. 26

B. 38

C. 51

D. 90

(b) 23 counters are shared between 2 friends so both get the same. You may use counters to help.

● ● ● ● ● ● ● ● ● ● ● ●
● ● ● ● ● ● ● ● ● ● ●

How many counters does each friend get? How many are left over? (1 mark)

(c) Ben says 47 + 25 = 73. Without adding, use the odd and even rules to check his answer. Is Ben right? Explain how you know. (2 marks)

Question 2 — Numbers beyond 10 000 (4 marks)

Four stadiums in Victoria, and how many people can fit in each.

Stadium	How many people can fit
Marvel Stadium	53 343
Eureka Stadium	11 000
Melbourne Cricket Ground (MCG)	100 024
AAMI Park	30 050

Source: Wikipedia, *Melbourne Cricket Ground*, *Marvel Stadium*, *Melbourne Rectangular Stadium*, *Eureka Stadium*, retrieved 2026-08-20.

(a) Put the four numbers in order, smallest to biggest. (1 mark)

(b) Write 100 024 in words. (1 mark)

(c) In 30 050, what is the 3 worth? (1 mark)

(d) What is one more than 99 999? (1 mark)

Question 3 — Adding and subtracting (5 marks)

No calculator for this question. Show your working.

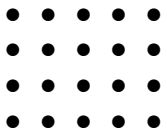
(a) Work out 358 + 276. Use a partition or jottings, and regroup when a place makes 10 or more. (2 marks)

(b) Work out 534 − 297. You may give both numbers the same amount, or use another way. (2 marks)

(c) Check your answer to part (b) with an addition. Write the number sentence you use. (1 mark)

Question 4 — Multiplying and dividing (4 marks)

(a) This array has equal rows. Write two number sentences for it. (1 mark)



(b) Work out 17 × 4. Split 17 into tens and ones, and show your working. (2 marks)

(c) 54 eggs are packed into cartons of 6. How many cartons are there? Use a times fact to help you. (1 mark)

Question 5 — Estimating (4 marks)

(a) Round 472 to the nearest hundred. (1 mark)

A. 400

B. 470

C. 500

D. 4 000

(b) Round each number to the nearest hundred, then estimate 394 + 278. (1 mark)

(c) Mia says 617 − 284 = 433. Estimate to check her answer. Is 433 reasonable? Explain how you know. (2 marks)

Question 6 — Algorithms (4 marks)

(a) Follow this algorithm.

Step 1: Pick a number. Step 2: Add 10. Step 3: Write the answer.

Start with 56. What answer do you get? (1 mark)

(b) This machine doubles every number that goes in. 14 goes in. What comes out? (1 mark)

(c) Write the steps of an algorithm that decides if a number is a multiple of 5. (Hint: look at the number it ends with.) (2 marks)

Total: 25 marks

Solutions

Teacher-facing. Test T1 is a classroom check, not an exam: untimed in principle with a 30-minute guidance duration, equipment permitted, and Question 3 (VC2M3N04) calculator-free per the CD wording.

Coverage and mark map

CD	Subtopic	Questions	Marks
VC2M3N01	1A Odd and even numbers	Q1	4
VC2M3N02	1B Reading, writing and ordering numbers beyond 10 000	Q2	4
VC2M3N04	1C Adding and subtracting two- and three-digit numbers	Q3	5
VC2M3N05	1D Multiplying and dividing one- and two-digit numbers	Q4	4
VC2M3N06	1E Estimating quantities and judging whether an answer is reasonable	Q5	4
VC2M3N09	1F Algorithms that investigate numbers	Q6	4
	Total		**25**

Every CD contributes at least 3 separately scored marks, as §7 requires. Multiple choice is 2 marks of 25 (8%), inside the one-quarter cap: Q1(a) and Q5(a), four options A–D each.

Answer key

Q	Part	Answer	Marks
1	(a)	C (51)	1
1	(b)	11 each, 1 left over	1
1	(c)	No — odd + odd = even, but 73 is odd	2
2	(a)	11 000, 30 050, 53 343, 100 024	1
2	(b)	one hundred thousand and twenty-four	1
2	(c)	30 000	1
2	(d)	100 000	1
3	(a)	634, working shown	2
3	(b)	237, working shown	2
3	(c)	237 + 297 = 534 (or 297 + 237 = 534)	1
4	(a)	4 × 5 = 20 and 5 × 4 = 20	1
4	(b)	68, split into 10 and	2

Q	Part	Answer	Marks
		7	
4	(c)	9 cartons	1
5	(a)	C (500)	1
5	(b)	400 + 300; about 700	1
5	(c)	No — estimate is about 300 and 433 is far from 300	2
6	(a)	66	1
6	(b)	28	1
6	(c)	Steps ending in the 0-or-5 rule	2

Worked solutions

Q1. (a) 26, 38 and 90 all end with 0, 2, 4, 6 or 8, so they are even. 51 ends with 1, so 51 is odd. The answer is **C**.

(b) 23 is odd, so the counters cannot split into 2 equal groups with nothing left over. Each friend gets 11 counters, because 11 + 11 = 22, and 23 − 22 = 1. **11 each, 1 left over.**

(c) 47 ends with 7, so 47 is odd. 25 ends with 5, so 25 is odd. Odd + odd = even, so the answer must be even. 73 ends with 3, so 73 is odd. **Ben is not right.** (Check: 47 + 25 = 72, and 72 is even.)

Marks: 1 for using the odd + odd = even rule; 1 for the correct judgement with a reason. Award both marks for any correct even/odd argument, even if the rule is stated in the student's own words.

Q2. (a) 11 000 and 30 050 and 53 343 have five digits; 100 024 has six digits, so it is biggest. Of the five-digit numbers, look at the tens of thousands: 1, then 3, then 5. So **11 000, 30 050, 53 343, 100 024**.

(b) Thousands part 100: *one hundred thousand*. Ones part 024: *twenty-four*. Together: **one hundred thousand and twenty-four**. Accept *one hundred thousand, twenty-four*.

(c) The 3 is in the tens of thousands place: 3 tens of thousands is **30 000**.

(d) 99 999 + 1 = **100 000**. Every place rolls over to 0 and a new 1 comes into the hundred-thousands place.

Q3. Calculators are not used in this question (VC2M3N04).

(a) Partition both numbers: 358 = 300 + 50 + 8 and 276 = 200 + 70 + 6. Add each place: 300 + 200 = 500, 50 + 70 = 120, 8 + 6 = 14. Then 500 + 120 + 14 = 634. The 14 ones regroup into 1 ten and 4 ones, and 12 tens + 1 new ten regroup into 1 hundred and 3 tens. **358 + 276 = 634.**

(b) Give both numbers the same amount: 297 needs 3 to make 300, so give 534 the same 3 more. 534 + 3 = 537 and 297 + 3 = 300. The gap stays the same, so 534 − 297 = 537 − 300 = **237**. Accept any correct place-value strategy, e.g. counting back: 534 − 300 = 234, and 234 + 3 = 237.

(c) Addition undoes subtraction: **237 + 297 = 534** (or 297 + 237 = 534). The parts add back to the whole, so the answer checks.

Marks: for (a) and (b), 1 mark for a place-value method shown in the working and 1 mark for the correct answer. If the answer is right with no working, award 1 mark only. Part (c) is 1 mark for a correct checking number sentence.

Q4. (a) The array has 4 rows of 5: **4 × 5 = 20**. The same dots make 5 lines of 4 going down: **5 × 4 = 20**.

(b) Split 17 into tens and ones: 17 = 10 + 7. Then 10 × 4 = 40 and 7 × 4 = 28. Add the parts: 40 + 28 = 68. So **17 × 4 = 68**.

(c) Ask: *6 times what makes 54?* 6 × 9 = 54, so 54 ÷ 6 = 9. **There are 9 cartons.**

Marks: for (b), 1 mark for the split into 10 and 7 with the two partial products, 1 mark for the correct total.

Q5. (a) 472 is closer to 500 than to 400, so it rounds to 500. The answer is **C**. (470 rounds to the nearest ten, not the nearest hundred; 4 000 rounds to the nearest thousand.)

(b) 394 is close to 400, and 278 is close to 300. 400 + 300 = 700, so 394 + 278 is **about 700**. (Check: 394 + 278 = 672, and 672 is close to 700.)

(c) Round each number to the nearest hundred: 617 is close to 600, and 284 is close to 300. 600 − 300 = 300, so the answer should be about 300. 433 is far from 300, so **433 is not reasonable**. (Check: 617 − 284 = 333, and 333 is close to 300.)

Marks: for (c), 1 mark for an estimate of about 300 with the rounded numbers shown, 1 mark for the judgement with a reason.

Q6. (a) Start with 56. Add 10: 56 + 10 = **66**.

(b) The machine doubles: 14 + 14 = **28**.

(c) The steps can be worded in different ways. Accept any clear, ordered set of steps that uses the rule, for example:

Step 1: Look at the number it ends with. Step 2: Is it 0 or 5? Step 3: Yes — the number is a multiple of 5. No — it is not a multiple of 5.

Marks: 1 mark for a step that looks at the number it ends with; 1 mark for the correct 0-or-5 decision. Steps may be numbered or written as a sentence.