

Adds two-digit numbers with and without regrouping

Mathematics K–10 · Starting

Read the explanations and worked teaching examples, then attempt the practice. Type in the answer fields or write on a printed copy. Save the PDF to keep typed responses. PDF responses are not submitted to the platform.

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Name: _____ Date: _____

Learning goal

I can add one- and two-digit numbers by partitioning tens and ones when the ones total is less than 10 and the total stays below 100.

- I can split a two-digit number into its tens and its ones.
- I can add the tens, add the ones, and put the two results back together.
- I can show an addition with base-ten blocks and read the answer off the blocks.
- I can add a whole ten to a two-digit number without changing the ones digit.
- I can check that my answer is sensible by estimating before I start.

The idea in context

$34 + 25$ can be represented by joining tens rods and unit cubes. Add matching place values, then combine the results.

Before you begin

Reads, writes and partitions two-digit numbers into tens and ones

Use the checks below to review this prerequisite. Revisit the linked explanation if needed, and return to the lesson when the method is clear.

Recalls addition facts to 20

Use the checks below to review this prerequisite. Revisit the linked explanation if needed, and return to the lesson when the method is clear.

Starting-point question 1

Which partition represents 58? Select one answer.

Circle your answer:

- A. 50 and 8
- B. 5 and 8

C. 50 and 80

Starting-point question 2

Work out $40 + 6$. Enter the numerical value.

Starting-point question 3

Work out $4 + 5$. Enter the numerical value.

Starting-point question 4

Work out $3 + 2$. Enter the numerical value.

Understand the concept

Adding ones to a two-digit number

For $34 + 5$, partition 34 as $30 + 4$. Add $4 + 5 = 9$, then $30 + 9 = 39$. The tens remain unchanged in this example because the ones total is below 10. If the ones total reaches 10, regrouping is needed.

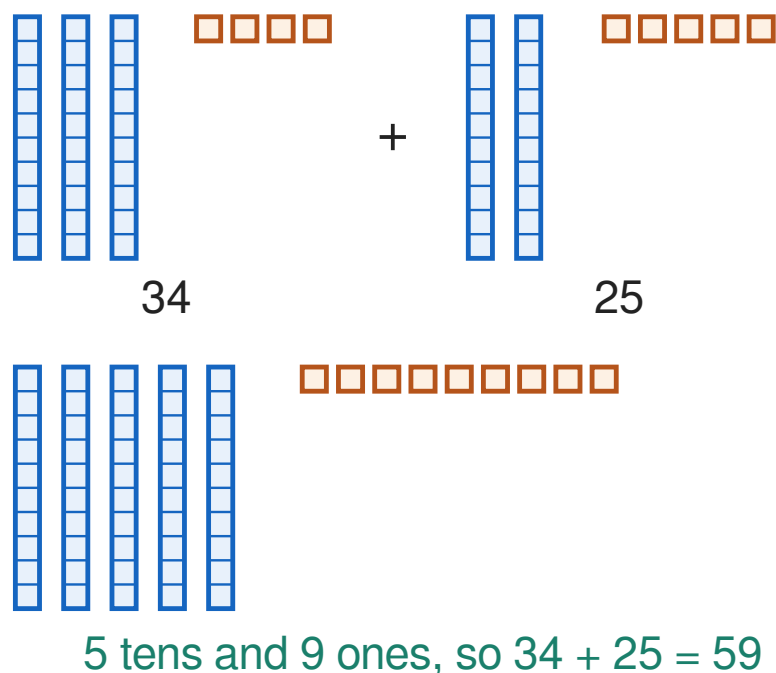
Adding whole tens

For $43 + 20$, add $40 + 20 = 60$ and retain the 3 ones, giving 63. Adding a multiple of ten leaves the ones digit unchanged; larger totals may also change the hundreds digit.

Adding two two-digit numbers

For $34 + 25$, add the matching parts: tens $30 + 20 = 50$; ones $4 + 5 = 9$. Recombine $50 + 9 = 59$. This is partitioning, also called the split strategy.

Adding with base-ten blocks: $34 + 25$



$34 + 25$ with base-ten blocks: three rods and four cubes joined to two rods and five cubes give five rods and nine cubes, which is 59.

Base-ten blocks in two rows. The top row shows three tens rods and four unit cubes, a plus sign, then two tens rods and five unit cubes. The bottom row shows five tens rods and nine unit cubes all together.

Use blocks, sketches or the labelled place-value table to distinguish tens from ones. Record the value of each part before adding.

Splitting into tens and ones: $34 + 25$

	tens	ones
34	30	4
25	20	5
total	50	9

$$50 + 9 = 59$$

The same addition written as a split: the tens column totals 50, the ones column totals 9, and $50 + 9 = 59$.

A table with columns headed tens and ones. The row for 34 shows 30 and 4, the row for 25 shows 20 and 5, and the total row shows 50 and 9. Underneath, 50 plus 9 equals 59.

Estimate before you calculate

Round 34 and 25 to the nearest ten to estimate $30 + 30 = 60$. The exact total 59 is close to 60. Estimation checks the size of an answer; it does not prove exact correctness. Check the place-value calculation as well.

The tens or ones may be added first because the same quantities are combined. Both orders must preserve every part of each addend.

Worked teaching examples

Follow the model

Work out $52 + 36$ by splitting, and check the answer against an estimate.

1. First an estimate: 52 is about 50 and 36 is about 40, so the answer should be near 90.
2. Now split both numbers. 52 is 50 and 2. 36 is 30 and 6.
3. Add the tens: $50 + 30 = 80$. This is the fact $5 + 3 = 8$, scaled to tens.
4. Add the ones: $2 + 6 = 8$.
5. Rejoin: $80 + 8 = 88$. So $52 + 36 = 88$.
6. Check against the estimate: 88 is close to 90, so the answer is in the right neighbourhood. If I had written 8 or 818, the estimate would have caught it immediately.

$52 + 36 = 88$. Split: $50 + 30 = 80$ and $2 + 6 = 8$, then $80 + 8 = 88$. The estimate of about 90 is consistent with it.

Follow the guided example

The Year 1 class collected 43 bottle tops and the Year 2 class collected 20. How many bottle tops altogether?

1. Are the amounts being joined? (Yes, so this is an addition: $43 + 20$.)
 2. Which part of 43 is going to change? (Only the tens, because 20 is a whole two tens with no ones.)
 3. Add the tens. ($40 + 20 = 60$.)
 4. What happens to the 3 ones? (Nothing - they stay as they are.)
 5. So what is the total? (63 bottle tops.)
- $43 + 20 = 63$, so the two classes collected 63 bottle tops. The tens go from 4 to 6 and the ones digit stays as 3.

Explain a step in your own words or add your working.

Apply the method: teaching example

work out $41 + 37$ by splitting, and estimate first.

1. Write an estimate in one line.
2. Split both numbers into tens and ones.
3. Add the tens, then add the ones.
4. Rejoin the two results and compare with your estimate.

Estimate: 41 is about 40 and 37 is about 40, so the answer should be near 80. Split: 41 is 40 and 1; 37 is 30 and 7. Tens: $40 + 30 = 70$. Ones: $1 + 7 = 8$. Rejoin: $70 + 8 = 78$. So $41 + 37 = 78$, which is 2 below the estimate of 80; rounding 41 down by 1 and 37 up by 3 increased the total by 2.

Explain a step in your own words or add your working.

Independent practice

Question 1

$$34 + 5 = ?$$

Question 2

$$62 + 7 = ?$$

Question 3

$$43 + 20 = ?$$

Question 4

$$25 + 30 = ?$$

Question 5

$$34 + 25 = ?$$

Question 6

$$52 + 36 = ?$$

Question 7

$$41 + 17 = ?$$

Question 8

Two collections contain 4 tens rods and 3 unit cubes beside 2 tens rods and 5 unit cubes. Write the addition and give the total: ____ + ____ = ____

Question 9

Set out $63 + 24$ as a split, showing the tens line and the ones line separately. Tens: $60 + 20 = \underline{\hspace{1cm}}$ Ones: $3 + 4 = \underline{\hspace{1cm}}$ Rejoin: $\underline{\hspace{1cm}}$

Question 10

At the school fete, the cake stall took \$32 and the plant stall took \$25. How much did the two stalls take altogether? Enter the amount in dollars, without the dollar sign.

Question 11

Find the missing number: $34 + \underline{\quad} = 54$

Question 12

Round each addend to the nearest ten, then calculate $47 + 31$ exactly. Estimate: ____ Exact sum: ____ Amount by which the estimate exceeds the exact sum: ____

Question 13

Rhea works out $43 + 20$ and writes 65. Which of these is her mistake?

Circle your answer:

- A. Changed the ones digit too
- B. Added every digit as if it were ones
- C. Forgot to add the tens
- D. Put the 2 tens onto the 3 ones

Question 13 — continued

Question 14

Work out $42 + 36$ twice: once by adding the tens first and once by adding the ones first. Explain why both give the same answer.

Question 14 — continued

Handwriting practice lines for the answer to Question 14. The page contains 15 sets of three horizontal lines (top solid, middle dashed, bottom solid) for writing practice.

Apply your understanding

Building without trading. (a) Write three different additions of two two-digit numbers that give 68, where neither number ends in zero and the ones do not add to more than nine. (b) What has to be true about the two ones digits for a question like this to need no trading? (c) Is $39 + 24$ one of the no-trading kind? Explain without working out the answer. (d) How many two-digit numbers could be added to 43 without needing a trade from the ones column, even if a hundreds trade is needed, if the other number must also be a two-digit number?

Lesson review

- I can split a two-digit number into its tens and its ones.
- I can add the tens, add the ones, and put the two results back together.
- I can show an addition with base-ten blocks and read the answer off the blocks.
- I can add a whole ten to a two-digit number without changing the ones digit.
- I can check that my answer is sensible by estimating before I start.

Use the learning goal to review your work. Explain the main idea in your own words and identify a step to revisit.

Practice hints

Try each question first. Cover the hints and reveal one at a time when you need support.

Question 1

1. Partition 34 and 5 into their place values. Keep each value with its matching column.
2. Add matching place values separately. If a column reaches ten units of that place, exchange ten for one in the next place.
3. Recombine the parts after regrouping. Subtract one original addend from your total to check that the other remains.

Question 2

1. Partition 62 and 7 into their place values. Keep each value with its matching column.
2. Add matching place values separately. If a column reaches ten units of that place, exchange ten for one in the next place.
3. Recombine the parts after regrouping. Subtract one original addend from your total to check that the other remains.

Question 3

1. Partition 43 and 20 into their place values. Keep each value with its matching column.
2. Add matching place values separately. If a column reaches ten units of that place, exchange ten for one in the next place.
3. Recombine the parts after regrouping. Subtract one original addend from your total to check that the other remains.

Question 4

1. Partition 25 and 30 into their place values. Keep each value with its matching column.
2. Add matching place values separately. If a column reaches ten units of that place, exchange ten for one in the next place.
3. Recombine the parts after regrouping. Subtract one original addend from your total to check that the other remains.

Question 5

1. Partition 34 and 25 into their place values. Keep each value with its matching column.
2. Add matching place values separately. If a column reaches ten units of that place, exchange ten for one in the next place.
3. Recombine the parts after regrouping. Subtract one original addend from your total to check that the other remains.

Question 6

1. Partition 52 and 36 into their place values. Keep each value with its matching column.
2. Add matching place values separately. If a column reaches ten units of that place, exchange ten for one in the next place.
3. Recombine the parts after regrouping. Subtract one original addend from your total to check that the other remains.

Question 7

1. Partition 41 and 17 into their place values. Keep each value with its matching column.
2. Add matching place values separately. If a column reaches ten units of that place, exchange ten for one in the next place.
3. Recombine the parts after regrouping. Subtract one original addend from your total to check that the other remains.

Question 8

1. Read each blank label and identify whether it asks for an addend, a place-value total or the final sum.
2. Write the tens and ones separately, or record the landing point after each specified number-line jump.
3. Check the completed number sentence from left to right. A missing addend can be checked by subtracting the known addend from the total.

Question 9

1. Read each blank label and identify whether it asks for an addend, a place-value total or the final sum.
2. Write the tens and ones separately, or record the landing point after each specified number-line jump.
3. Check the completed number sentence from left to right. A missing addend can be checked by subtracting the known addend from the total.

Question 10

1. Identify the quantities to combine and write the addition before calculating.
2. Partition by place value or use a nearby round number and correct for the adjustment.
3. Check with a second method and include the unit when interpreting your result.

Question 11

1. Read each blank label and identify whether it asks for an addend, a place-value total or the final sum.
2. Write the tens and ones separately, or record the landing point after each specified number-line jump.
3. Check the completed number sentence from left to right. A missing addend can be checked by subtracting the known addend from the total.

Question 12

1. Identify the quantities to combine and write the addition before calculating.
2. Partition by place value or use a nearby round number and correct for the adjustment.
3. Check with a second method and include the unit when interpreting your result.

Question 13

1. Identify the mathematical claim in each option before choosing.
2. Check what each digit represents and whether regrouping preserves the value.
3. Test the proposed method using the original addends; a correct calculation must retain every place value.

Question 14

1. Partition both addends into tens and ones.
2. Record both requested orders without losing any part.
3. Compare the collections represented in the two records. Explain why changing their order does not change their total.