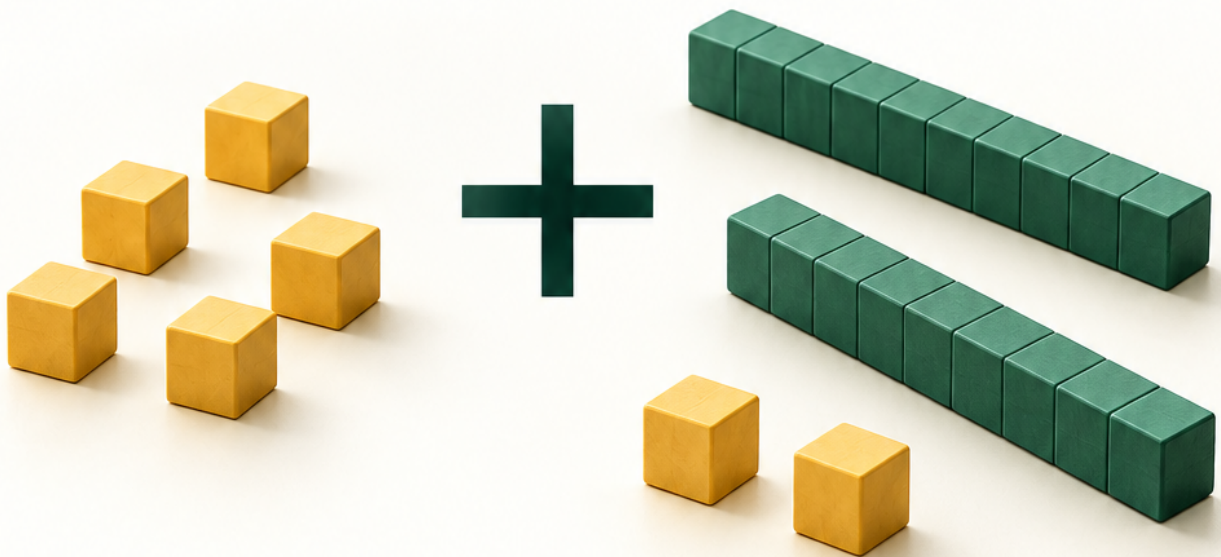


Two-Digit Addition with Regrouping

Understanding Tens, Ones, and Carrying



Understanding Tens and Ones

Build two-digit numbers with base-10 blocks.



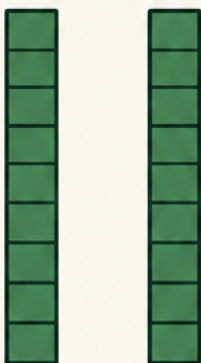
1 ten = 10 ones



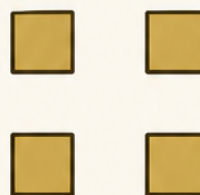
1 one

Let's build 24.

TENS



ONES



2 tens + 4 ones = 24

20 + 4 = 24

Try it: Build 32 with blocks.
How many tens? How many ones?

Understanding tens and ones

Q1. A model has 4 tens rods and 3 ones cubes. What number does it show?

Q2. Build 60 with tens rods and ones cubes. How many of each do you need?

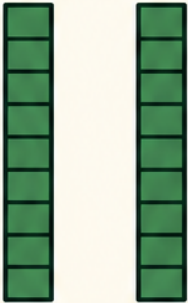
Q3. Draw a base-10 model for 76. Explain what each digit means.

Q4. A model has 5 tens rods and 13 loose cubes. What number is it, and how can you show it with fewer loose cubes?

Q5. You use exactly 7 pieces: 5 tens rods and the rest ones cubes. What number have you built?

Building Addition Problems

Keep tens and ones in their own columns.

	TENS	ONES
27		
+ 15		

$$27 = 2 \text{ tens} + 7 \text{ ones}$$

$$15 = 1 \text{ ten} + 5 \text{ ones}$$

Line up the place values.

Tens under tens. Ones under ones.

	T	O
	2	7
+	1	5

Try it: Build $36 + 18$ in two rows.

Building addition problems

Q6. Build $21 + 34$ in two rows. Tell how many rods and cubes belong in each row.

Q7. Set up $32 + 45$ in tens and ones columns, then find the total.

Q8. For $44 + 28$, how many rods and loose cubes are there altogether before you exchange any cubes?

Q9. Draw the two rows for $56 + 17$, then combine and regroup.

Q10. For $61 + 18$, a student puts the 8 underneath the 6 and the 1 underneath the 1. What is wrong? Show the correct setup and total.

Adding the Ones First

Combine the ones cubes and count them.

$$27 + 15$$



7 ones

+



5 ones



Bring the ones together.



1

2

3

4

5

6



7

8

9

10

11

12

$$7 \text{ ones} + 5 \text{ ones} = 12 \text{ ones}$$

$$7 + 5 = 12$$

12 ones is more than 9 ones.

Next, we will regroup 10 ones as 1 ten.

Start in the ones column.

Try it: For $38 + 16$, add the ones: $8 + 6 = \underline{\quad}$.

Adding the ones first

Q11. In $24 + 13$, add only the ones. Will you need to regroup?

Q12. In $25 + 16$, add only the ones. Can they all remain as a single ones digit?

Q13. In $48 + 23$, how many ones are there before regrouping, and how many remain afterward?

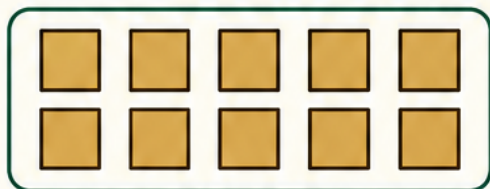
Q14. In $57 + 26$, explain why the ones digit of the answer will be 3 rather than 13.

Q15. In $34 + 2\Box$, which digit makes the ones add to exactly 10? What stays in the ones column?

Regrouping Ten Ones

Exchange 10 ones for 1 ten.

Start with 12 ones.

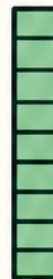


10 ones



2 ones

Trade the group of 10 for 1 tens rod.



10 ones = 1 ten

After regrouping



1 ten + 2 ones = 12

The blocks look different, but the value stays the same.

12 ones = 1 ten and 2 ones.

Try it: Regroup 14 ones. ____ ten and ____ ones.

Exchanging ten ones for one ten

Q16. Exchange 10 loose cubes for tens rods. How many rods and loose cubes do you have afterward?

Q17. Regroup 13 ones into tens and ones.

Q18. Regroup 18 ones. Explain why you cannot make two tens.

Q19. A model has 3 tens rods and 16 ones cubes. Regroup it and state its value.

Q20. A model has 4 tens and 19 ones. A student trades 10 cubes for a rod but keeps all 19 cubes too. Explain the error and give the correct model.

Connecting Regrouping to Carrying

The carried 1 means 1 ten.

$$27 + 15$$

Add the ones: $7 + 5 = 12$.

12 ones = 1 ten + 2 ones.



1 ten (10 ones)



2 ones

TENS	ONES
Record the new ten here. 1 2 7 + 1 5 2	Write 2 in the ones column.

1. Write the 2 remaining ones.
2. Carry 1 ten to the tens column.

We carry 1 TEN, which is worth 10.

Try it: In $38 + 16$, $8 + 6 = 14$.
Write ____ ones and carry ____ ten.

Connecting regrouping to carrying

Q21. In $37 + 18$, the ones add to 15. What does the carried 1 stand for?

Q22. In $48 + 17$, what do you write in the answer's ones place, and what do you carry?

Q23. Solve $29 + 31$. Explain why the answer needs a zero.

Q24. A student says $39 + 24 = 53$ after writing 3 ones. Which step was missed? What is the correct sum?

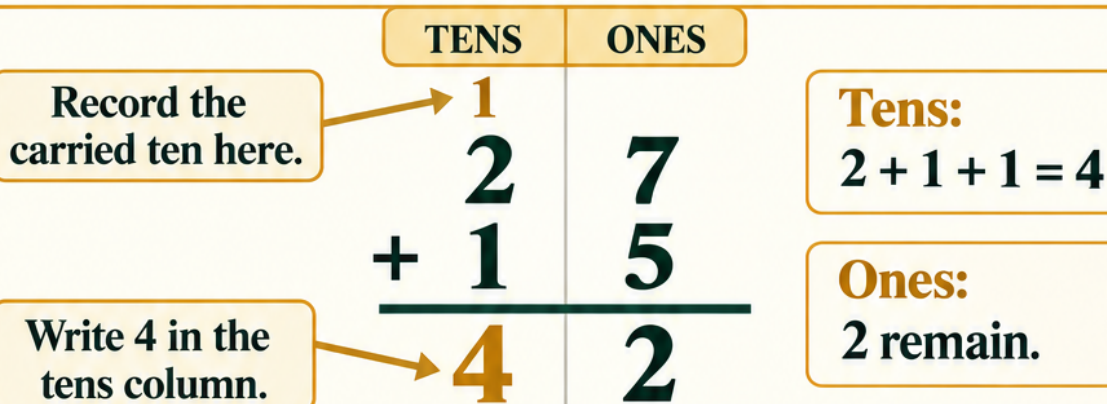
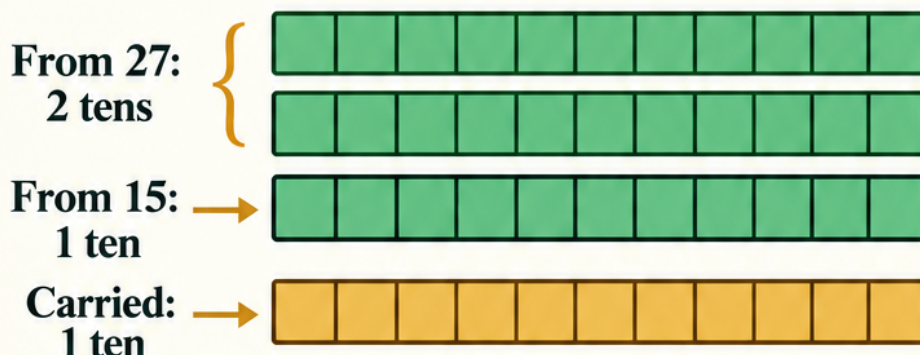
Q25. In $46 + 2\square$, the ones leave 3 cubes after making one new ten. Find the missing digit and the sum.

Adding the Tens.

Remember to include the carried ten.

$$27 + 15$$

2 tens + 1 ten + 1 carried ten = 4 tens.



4 tens + 2 ones = 42

$$27 + 15 = 42$$

The carried 1 represents 10, so add it with the tens.

Try it: Finish $38 + 16$.

Tens: $3 + 1 + 1 = \underline{\quad}$

Answer: $\underline{\quad}$

Adding all the tens

Q26. There are 2 original tens in one row, 4 original tens in another, and 1 new ten from regrouping. If 3 ones remain, what is the total?

Q27. Solve $24 + 38$. Name every ten you include.

Q28. Solve $47 + 25$ and describe the final block model.

Q29. Solve $58 + 34$. Explain why adding only $5 + 3$ tens would not be enough.

Q30. Solve $68 + 12$. How many tens and ones should the final model show?

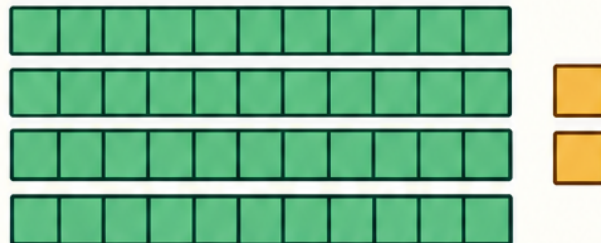
Solving and Checking Examples

Solve, then check with base-10 blocks.

Example 1: $27 + 15 = 42$

Ones: $7 + 5 = 12 \rightarrow$
1 ten and 2 ones.

Tens: $2 + 1 + 1 = 4.$

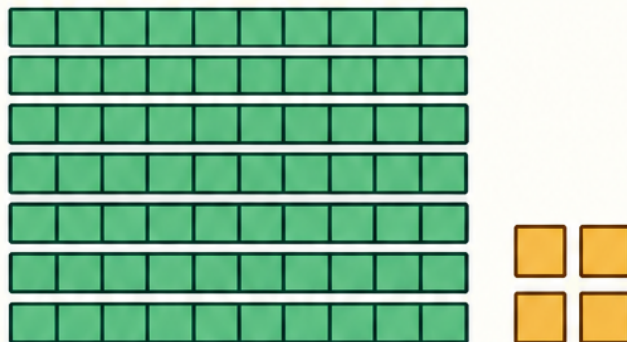


4 tens + 2 ones = 42

Example 2: $46 + 28 = 74$

Ones: $6 + 8 = 14 \rightarrow$
1 ten and 4 ones.

Tens: $4 + 2 + 1 = 7.$



7 tens + 4 ones = 74

Check your work:

- 1** Count the tens rods.
- 2** Count the ones cubes.
- 3** Does the model match your answer?

Try it:

Solve and model
 $35 + 27.$

Solving and checking a complete sum

Q31. Solve $16 + 25$ and check the answer with rods and cubes.

Q32. Solve $33 + 29$. Check by adding 20 first, then 9.

Q33. Solve $49 + 18$. Check by adding 10 first, then 8.

Q34. Solve $54 + 37$. Explain how your model proves the sum.

Q35. A student writes $68 + 24 = 82$. Use the ones exchange and the tens count to find and fix the error.

Regrouping in Word Problems

Read, model, regroup, and solve.

The class library has 28 books.
Families donate 16 more books.
How many books are there altogether?



1 Write the equation.

$$28 + 16 = ?$$

2 Add and regroup the ones.

$$8 + 6 = 14 \text{ ones}$$

$$14 \text{ ones} = 1 \text{ ten} + 4 \text{ ones.}$$

3 Add the tens.

$$2 + 1 + 1 = 4 \text{ tens.}$$

4 Model and solve.



$$4 \text{ tens} + 4 \text{ ones} = 44$$

$$\begin{array}{r} 1 \\ 28 \\ + 16 \\ \hline 44 \end{array}$$

There are 44 books altogether.

Your turn:

A museum has 37 visitors in the morning, Then 25 more visitors arrive. How many visitors is that altogether?

Equation: _____ Answer: _____

Regrouping in word problems

Q36. A tray holds 18 red counters and 14 blue counters. How many counters are on the tray?

Q37. A class has 26 crayons. A family donates 19 more. How many crayons does the class have now?

Q38. A garden has 37 yellow flowers and 28 purple flowers. How many flowers are there altogether?

Q39. A school collects 46 cans in the morning and 39 in the afternoon. How many cans are collected in all?

Q40. A reading club earns 48 points on Monday and 27 on Tuesday. Its goal is 80 points. How many points has it earned, and how many more does it need?

Homework review

R1. Build 64 with base-10 blocks. State the value of each digit.

R2. Set up $31 + 26$ in two rows. What goes in the tens column and the ones column?

R3. For $39 + 13$, add just the ones and describe the exchange.

R4. Regroup 4 tens and 15 ones. What number is represented?

R5. In $58 + 13$, what does the carried 1 mean, and where does it belong?

Homework review

R6. Solve $26 + 37$. Show the original tens and the carried ten separately.

R7. Solve $65 + 18$, then describe a block model that checks your answer.

R8. A shelf has 47 books. A teacher adds 16 more. How many books are on the shelf now?

Homework word problems

W1. Lena has 17 stickers. Her friend gives her 15 more. How many stickers does Lena have now?

W2. A basket contains 24 apples and 19 pears. How many pieces of fruit are in the basket?

W3. A class makes 36 paper stars on Monday and 17 on Tuesday. How many stars does it make altogether?

W4. A library shelf holds 45 storybooks and 28 fact books. How many books are on the shelf?

W5. A team collects 56 bottle caps. Another team adds 27 caps to the collection. How many caps are collected in all?

Homework word problems

W6. A bus has 75 seats. There are 38 children and 24 adults on the bus. How many people are aboard, and how many seats are empty?

W7. A class sells 29 tickets before lunch and 46 after lunch. Its goal is 80 tickets. How many tickets has it sold, and how many more are needed?

W8. Three jars hold 16, 27, and 18 marbles. How many marbles are there altogether?

W9. A museum admits 24 visitors in the morning, 18 at midday, and 29 in the afternoon. How many visitors arrive during the day?

W10. A class collects 47 pencils and then receives 26 donated pencils. Later it finds another box of 18 pencils. How many pencils does it have altogether?

Homework word problems

W11. Three children have 27, 18, and 26 beads. They combine all their beads. Find the total and describe the regrouping in both additions.

W12. A school needs 90 cups for a celebration. It has one box of 35 cups and another of 28 cups. How many cups does it already have, and how many more must it get?