

Adding and Subtracting Within 1,000: math lesson, Grade 3 – download the PDF

How many pages are in two books? How many stickers are left after you trade some away? Every day you add and subtract numbers that go up to 1,000. In this chapter you will learn quick tricks you can do in your head, the written method called the standard algorithm, a way to estimate, and a way to check your answers.

1. Place value and regrouping

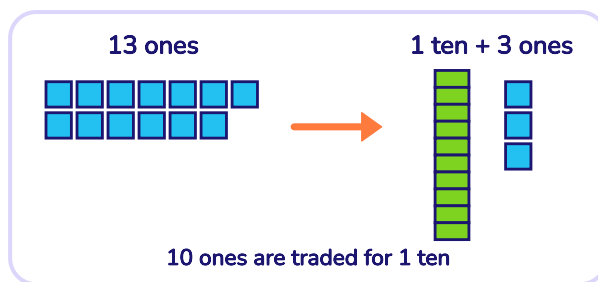
A 3-digit number is made of **hundreds**, **tens** and **ones**. The digit's place tells you its value. For example, in 457 the digit 4 means 4 hundreds, the digit 5 means 5 tens, and the digit 7 means 7 ones.

Hundreds	Tens	Ones	Number
4	5	7	$400 + 50 + 7 = 457$
2	0	9	$200 + 0 + 9 = 209$

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Regrouping

Regrouping means trading units without changing the value of a number: 10 ones can be traded for 1 ten, and 10 tens can be traded for 1 hundred. You can also trade the other way: 1 hundred becomes 10 tens, and 1 ten becomes 10 ones.



Regrouping is the secret behind both written methods. When you add and get 10 or more in a column, you trade up. When you subtract and a digit is too small, you trade down to get more units to work with.

2. Mental addition strategies

Many sums are quick if you choose a smart plan. Here are three strategies.

- **Break apart by place value.** Add the hundreds, then the tens, then the ones, and put the pieces together.
- **Make a friendly number.** Change one number to a round number such as 100, 200 or 300, add, and then fix the extra.
- **Count on.** Start at the larger number and jump by hundreds, then tens, then ones.

E **Example 1: breaking apart** Find $135 + 248$. Add the hundreds: $100 + 200 = 300$. Add the tens: $30 + 40 = 70$. Add the ones: $5 + 8 = 13$. Then $300 + 70 + 13 = 383$. So $135 + 248 = 383$.

E **Example 2: making a friendly number** Find $346 + 298$. The number 298 is 2 less than 300. Add 300 instead: $346 + 300 = 646$. You added 2 too many, so take 2 back: $646 - 2 = 644$. So $346 + 298 = 644$.

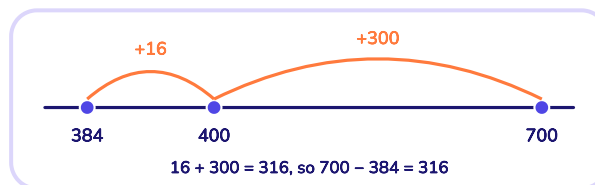
⚠ **Careful** When you add a little extra to make a friendly number, you must take that extra away at the end. If you forget, your answer will be too big.

3. Mental subtraction strategies

Subtraction can also be done in your head. Try these ideas.

- **Count up to find the difference.** Start at the smaller number and hop up to the larger one. Add the hops.
- **Subtract in parts.** Take away the hundreds, then the tens, then the ones.
- **Make a friendly number.** Subtract a round number and then fix the extra.

E **Example 3: counting up** Find $700 - 384$. From 384 hop to 400, which is 16 more. Then hop from 400 to 700, which is 300 more. The total hop is $16 + 300 = 316$. So $700 - 384 = 316$.



Another example: to find $842 - 215$ in parts, take away 200 to get 642, then take away 15 to get 627. For $842 - 199$, subtract 200 and then add 1 back: $842 - 200 = 642$ and $642 + 1 = 643$.

! **Zyro's tip** On my planet we say: "Near a round number? Jump to it first!" Counting up to 100, 200 or 300 makes the hops small and easy to remember.

4. The standard algorithm for addition

When numbers are big, you can line them up and add one column at a time, starting with the ones. The numbers must be lined up by place value so that ones are over ones, tens over tens, and hundreds over hundreds.

M**Adding with the standard algorithm**

1. Line up the digits: ones under ones, tens under tens, hundreds under hundreds.
2. Add the ones. If the sum is 10 or more, write the ones digit and regroup 1 ten to the tens column.
3. Add the tens, including any regrouped ten. If the sum is 10 or more, regroup 1 hundred.
4. Add the hundreds, including any regrouped hundred.

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Example 4: adding with regrouping Find $527 + 286$. Ones: $7 + 6 = 13$, so write 3 and regroup 1 ten. Tens: $2 + 8 + 1 = 11$, so write 1 and regroup 1 hundred. Hundreds: $5 + 2 + 1 = 8$.

$$\begin{array}{r} 527 \\ + 286 \\ \hline 813 \end{array}$$

So $527 + 286 = 813$.

5. The standard algorithm for subtraction

In subtraction you also start with the ones. When the top digit is smaller than the bottom digit, you cannot take away, so you regroup: you trade 1 ten for 10 ones, or 1 hundred for 10 tens.

M**Subtracting with the standard algorithm**

1. Write the larger number on top and line up the digits by place value.
2. Look at the ones. If the top digit is smaller, regroup 1 ten as 10 ones, then subtract.
3. Do the same in the tens column, regrouping 1 hundred as 10 tens if needed.
4. Subtract the hundreds.

E **Example 5: subtracting across a zero** Find $603 - 247$. The ones digit 3 is too small for 7, and the tens digit is 0, so there is no ten to trade. First trade 1 hundred for 10 tens: 6 hundreds become 5 hundreds and 10 tens. Then trade 1 of those tens for 10 ones: now there are 9 tens and 13 ones. Subtract: $13 - 7 = 6$, $9 - 4 = 5$, $5 - 2 = 3$.

$$\begin{array}{r} 603 \\ - 247 \\ \hline 356 \end{array}$$

So $603 - 247 = 356$.

A **Careful** Never subtract the smaller digit from the larger digit just because it is easier. In the ones column, $3 - 7$ is not the same as $7 - 3$. Regroup instead.

6. Estimating sums and differences

An **estimate** is a close answer found with easy numbers. To estimate, round each number to the nearest hundred (or nearest ten for a closer estimate), then add or subtract the rounded numbers. Estimating helps you decide whether an exact answer makes sense.

E **Example 6: estimating a sum** Estimate $489 + 312$. Round 489 up to 500 and 312 down to 300. Then $500 + 300 = 800$. The exact sum is 801, which is very close to the estimate. If you had found 701 or 901, the estimate would warn you that something went wrong.

The sign $\approx$ means “is about equal to.” You can write $489 + 312 \approx 800$.

7. The inverse relationship

Addition and subtraction are **inverse operations**: one undoes the other. If you add 312 to 489 you get 801, and if you subtract 312 from 801 you get back to 489. Numbers that go together this way form a fact family.

P **Fact family**

If $a + b = c$, then $b + a = c$, $c - a = b$ and $c - b = a$.

E **Example 7: checking with the inverse** Maya finds $801 - 312 = 489$. To check, add the answer to the number you subtracted: $489 + 312 = 801$. The result matches the starting number, so the subtraction is correct.

You can check an addition in the same way: to check $a + b = c$, subtract and see whether $c - b$ gives a . The inverse relationship also helps with unknowns: if $n + 275 = 640$, then $n = 640 - 275$.

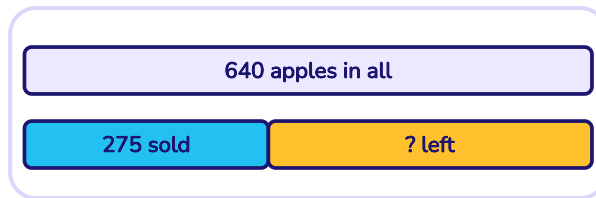
8. One-step word problems

A word problem tells a short story. To solve it, work out what is happening: are parts being put together (add), or is a part being taken away or compared (subtract)? A bar model helps you see it.

M **Solving a word problem**

1. Read the problem and decide what you need to find.
2. Draw a bar model and mark the known numbers and the unknown.
3. Write an equation with a letter for the unknown number.
4. Solve it, then check with the inverse operation.
5. Answer in a complete sentence with the unit.

E **Example 8: a bar model** A fruit stand had 640 apples. It sold 275 of them. How many apples are left? The whole is 640 and one part is 275, so $640 - 275 = a$, and $a = 365$. Check: $365 + 275 = 640$. There are 365 apples left.



Do not rely on clue words alone. The word “left” often means subtract, but always think about the story. If you know the parts and want the whole, add. If you know the whole and one part, subtract.

Key takeaways

- Regrouping trades 10 of one unit for 1 of the next unit, without changing the value.
- Mental strategies: break apart, make a friendly number, count up, subtract in parts.
- In the standard algorithm, line up the places and start with the ones. Regroup when needed.
- Round to the nearest hundred (or ten) to estimate, and use the estimate to check that your answer is reasonable.
- Addition and subtraction are inverse operations: use one to check the other.
- For a word problem, draw a bar model, write an equation, solve, check, and answer in a sentence.



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