Add and Subtract within 1,000
Grade 2

Objective	Students will use number lines and place value using partial sums and differences to add and subtract numbers within 1,000.
Student-friendly objective	I can use a number line to add and subtract numbers within 1,000. I can use place value with partial sums and differences to add and subtract numbers within 1,000.
Standard	
Key vocabulary	number line, place value, sum, difference, break apart
Materials	whiteboard and markers, blank number lines (printed or drawn), place value charts, base-10 blocks (optional) Guided Practice Resource Sheet, Guided Practice Worksheet, Guided Practice Answer Key, Independent Practice Worksheet, Independent Practice Answer Key

Teacher Tip!

Consider breaking this skill into two separate sessions, one to address addition and the other to address subtraction. Notes throughout this resource indicate how to divide the content. If necessary, review place value concepts (ones, tens, hundreds) before beginning.

Introduce the Skill

In this lesson, we will use number lines and place value with partial sums and differences to add and subtract numbers up to 1,000.

Guided Practice

Session 1: Addition with Number Lines and Place Value Using Partial Sums

Addition with Number Lines

- Present students with a scenario. Say, "Let's say the school library has 342 fiction books. The library just received 235 more fiction books as a donation. How many fiction books does the library have now? To find the answer, we must add 342 and 235." Write "342 + 235 =" on the whiteboard. Tell students that today they will add the numbers using two different strategies. Then give each student a copy of the Guided Practice Resource Sheet.
    - Begin by drawing an open number line on the board.

- Explain that you will start the number line at 342 to show the first number in the addition statement. Draw a vertical line on the number line near the left end and write “342” beneath it. Call students’ attention to the “342” on the first number line on the Guided Practice Resource Sheet.
- Then point to “235” and ask volunteers to identify how many hundreds, tens, and ones are in the number (2 hundreds, 3 tens, 5 ones).
- Explain that you will use big jumps on the number line to show hundreds, medium jumps to show tens, and small jumps to show ones.
- Model addition using the number line, as students do the same on the number line on their Guided Practice Resource Sheet. Say, “235 has two hundreds, so we need to make two big jumps from 342. Make the jumps with me on your number line. One big jump gets us from 342 to 442.” On the number line, draw an arrow showing a big jump and underneath the number line write “442.” Then continue: “Another jump gets us from 442 to 542.” On the number line, draw a big jump and underneath write “542.”
- Say, “Now that we’ve added the hundreds, we need to add the tens. 235 has three tens, so we need to make three medium jumps. Let’s do the jumps together.” Demonstrate three medium jumps on the number line, labeling the end of each jump with each new value (“552,” “562,” “572”).
- Say, “Now that we’ve added the hundreds and the tens, we need to add the ones. 235 has five ones, so we need to make five small jumps. Let’s make the jumps together again.” Demonstrate five small jumps on the number line, labeling the end of each jump with each new value (“573,” “574,” “575,” “576,” “577”).
- Say, “So, 342 plus 235 equals 577. The library has 577 fiction books.”

<u>Addition with Place Value Using Partial Sums</u>

- Clear the whiteboard and write “137 + 245.” Explain that this time, you will use place value with partial sums to add the two numbers together.
  - Say, "To work with partial sums, we need to start by breaking the numbers out by place value."
  - Break out each number by place value and write the expressions next to each other on the board.

    137 = 100 + 30 + 7 245 = 200 + 40 + 5
  - Refer to the Guided Practice Resource Sheet for the organizational structure of this process and use this structure on the whiteboard. Direct students’ attention to their Guided Practice Resource Sheet and have them fill in the example as you go.
  - Explain that now you will add the hundreds together to get a partial sum of 300. Write 300 in the space provided. Repeat to get the partial sums for the tens and ones; write these sums in the spaces provided.
  - Say “Now that we have the three partial sums, we can add them together to find the total sum of 137 and 245.”
  - Write the three partial sums in the spaces provided, and walk students through combining 300 + 70 + 12 to find the total sum.

- Say “So, the sum of 137 and 245 is 382.”

- Give each student a copy of the Guided Practice Worksheet for Session 1. Walk through each problem with students, guiding them through using number lines and partial sums to solve addition problems. Use the Guided Practice Answer Key to help guide the conversation.

Session 2: Subtraction with Number Lines and Place Value Using Partial Differences

Subtraction with Number Lines

- Present a real-world scenario: "The school library has 562 books. Students check out 253 books. How many books remain in the library?" Tell students that this problem can be solved using subtraction.
    - Draw a blank number line on the whiteboard. Explain that a number line can also help us visualize subtraction. Say, "We need to start with 562 on our number line and then subtract 253."
    - Label a point at the far right of the number line with “562.” Then explain, “Now I need to subtract 253. I can break this down by subtracting the hundreds first, then the tens, then the ones. We can show this using large, medium, and small jumps like we did with addition on number lines. The difference is that for subtraction, we start on the right of the number line and move to the left with our jumps.”
    - Model subtracting using the number line as students follow along on the Guided Practice Resource Sheet. Say, “253 has two hundreds, so we need to make two big jumps from 562. Make the jumps with me on your number line. One big jump gets us down from 562 to 462, and one more jump gets us down to 362.” On the number line, draw an arrow for each jump and label the numbers as you go.
    - Say, “Now that we’ve subtracted the hundreds, we need to subtract the tens. 253 has five tens, so we need to make five medium jumps. Let’s do the jumps together.” Demonstrate five medium jumps on the number line, labeling the numbers as you go, ending at “312.”
    - Say, “Now that we’ve subtracted the hundreds and the tens, we need to subtract the ones. 253 has three ones, so we need to make three small jumps. Let’s make the jumps together again.” Demonstrate three small jumps on the number line, labeling the numbers as you go, ending at “309.”
    - Say, “562 minus 253 equals 309. So, there are 309 books remaining in the library.”

Subtraction with Place Value Using Partial Differences

- Introduce subtraction using place value with a new problem (452 – 138). Write the subtraction statement horizontally and explain, “Another way to subtract numbers is to break the second number apart by place value and subtract each place value from the first number separately.”
    - Show: 138 = 100 + 30 + 8
    - Explain that you subtract the hundreds from the first number in the subtraction statement, as shown by 452 – 100 = 352. Then, explain that you subtract the tens from what is left, as shown by 352 – 30 = 322. Then, explain that you subtract the ones from what is left, as shown by 322 – 8 = 314. Say “Now that we’ve subtracted the hundreds, tens, and ones, we have our answer. So, the difference of 452 and 138 is 314.”

- Distribute the Guided Practice Worksheet for Session 2. Walk through each problem with students, guiding them through using number lines and partial differences to solve subtraction problems. Use the Guided Practice Answer Key to help guide the conversation.

Observe and Respond

If a student . . .	Then . . .
Has difficulty drawing arrows of the correct length on the number line	Suggest using skip counting to ensure each jump is proportional. For example, when adding 100, the jump should be longer than when adding 10 or 1.
Struggles with partial sums or differences	Provide a place value chart and have students write each number in the chart before breaking it down to show each place value. This visual representation can help students see the hundreds, tens, and ones more clearly.
Makes calculation errors	Encourage the student to use base-10 blocks alongside the number line or partial sums/differences to represent the numbers concretely.

Independent Practice

Session 1: Distribute the Independent Practice Worksheet, Session 1. Have students complete the worksheet independently. Refer to the Independent Practice Answer Key to review the answers as a group. Another option is to review individual student work and discuss answers with students one-on-one.

Session 2: Distribute the Independent Practice Worksheet, Session 2. Have students complete the worksheet independently. Refer to the Independent Practice Answer Key to review the answers as a group. Another option is to review individual student work and discuss answers with students one-on-one.

Learner Accommodations

Advanced learner	Struggling learner	English learner
Challenge students to create their own word problems involving addition and subtraction within 1,000. Have them solve the problems using both number lines and partial sums/differences, then explain which method they prefer and why.	Provide students with pre-drawn number lines to help them make accurate jumps. Also, provide a place value chart to help organize the partial sums and differences calculations.	Use visual supports such as base-10 blocks or place value charts to reinforce the concepts. Provide sentence frames such as "First, I add/subtract the _____. Then I add/subtract the _____. Finally, I add/subtract the _____."

Early Finishers

Have students write their own addition and subtraction problems and solve them using both number lines and partial sums/differences. Then have them compare the two methods and explain which one they find easier and why.

Extension Activities

In Class

Provide students with a set of three-digit numbers. Have them work in pairs to create addition and subtraction problems that have specific targets (e.g., create a problem with a sum close to 500 or a difference close to 200). Students should solve their problems using both number lines and partial sums/differences.

At Home

Send home the completed Guided Practice Resource Sheets (Sessions 1 and 2) and a set of blank number lines. Have students create and solve two addition problems and two subtraction problems with numbers within 1,000. Family members or guardians can check the student's work and discuss the strategies used.

Add with Number Lines and Place Value Using Partial Sums

Using a Number Line to Add

- Start by placing the first number on the left.
- Jump forward to the right by the hundreds, then the tens, then the ones in the second number.

342 + 235

Using Place Value with Partial Sums to Add

- Break apart each number by place value.
- Add the hundreds, tens, and ones separately.
- Combine the partial sums.

137 + 245

137 = 100 + 30 + 7 245 = 200 + 40 + 5

Hundreds: 100 + 200 = _____

Tens: 30 + 40 = _____

Ones: 7 + 5 = _____

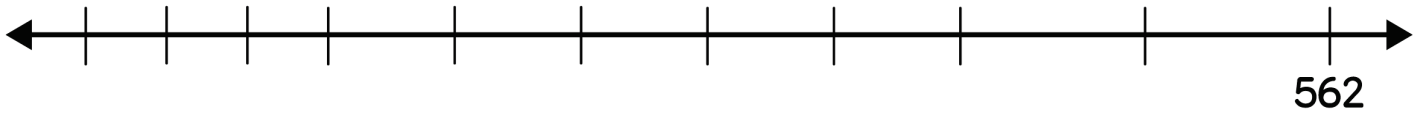
Sum of 137 + 245 = _____ + _____ + _____ = _____

Subtract with Number Lines and Place Value Using Partial Differences

Using a Number Line to Subtract

- Start by placing the first number on the right.
- Jump back to the left by the hundreds, then the tens, then the ones in the second number.

Example: 562 – 253



Using Place Value with Partial Differences to Subtract

Example: 452 – 138

Break apart the second number by place value.

138 = _____ + _____ + _____

Subtract the hundreds.

452 – _____ = _____

Subtract the tens.

_____ – _____ = _____

Subtract the ones.

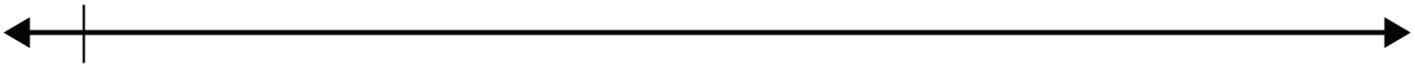
_____ – _____ = _____

Add with Number Lines and Place Value Using Partial Sums

Using a Number Line to Add

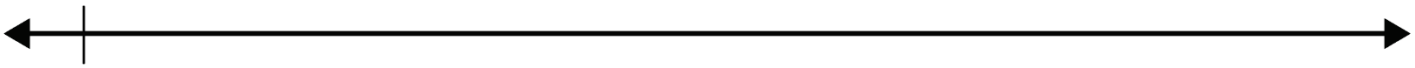
Place the first number on the left. Jump forward to the right by the hundreds, then the tens, then the ones in the second number.

1. 617 + 326 = _____



_____

2. 185 + 412 = _____



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Using Place Value with Partial Sums to Add

- Break each number apart by place value.
- Add the hundreds, tens, and ones separately.
- Combine the partial sums.

3. 167 + 242

167 = _____ **+** _____ **+** _____ **242 =** _____ **+** _____ **+** _____

Hundreds: _____ + _____ = _____

Tens: _____ + _____ = _____

Ones: _____ + _____ = _____

Sum of 167 + 242 = _____ + _____ + _____ = _____

4. 521 + 315

521 = _____ **+** _____ **+** _____ **315 =** _____ **+** _____ **+** _____

Hundreds: _____ + _____ = _____

Tens: _____ + _____ = _____

Ones: _____ + _____ = _____

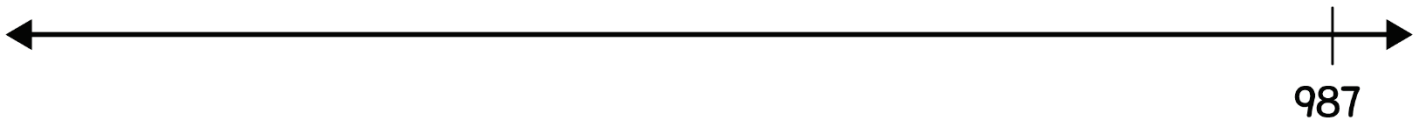
Sum of 521 + 315 = _____ + _____ + _____ = _____

Subtract with Number Lines and Place Value Using Partial Differences

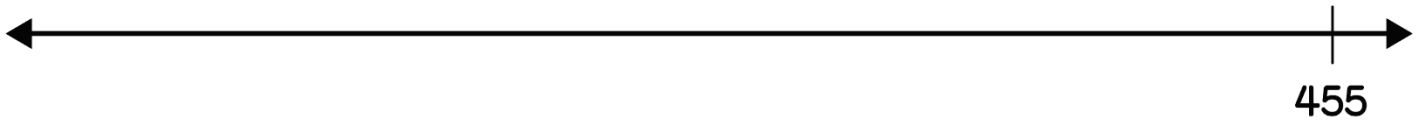
Using a Number Line to Subtract

- Start by placing the first number on the right.
- Jump back to the left by the hundreds, then the tens, then the ones in the second number.

1. 987 – 526



2. 455 – 317



Using Place Value with Partial Differences to Subtract

Break apart the second number by place value. Subtract the hundreds, then the tens, then the ones.

3. 861 – 732

Break apart the second number:

732 = _____ + _____ + _____

Subtract:

861 – _____ = _____

_____ – _____ = _____

_____ – _____ = _____

4. 413 – 152

Break apart the second number:

152 = _____ + _____ + _____

Subtract:

413 – _____ = _____

_____ – _____ = _____

_____ – _____ = _____

Add and Subtract within 1,000

Guided Practice Worksheet Answer Key

Session 1

1: 617 + 326 = **943**

2: 185 + 412 = **597**

3: 167 + 242 = **409**

4: 521 + 315 = **836**

Session 2

1: 987 − 526 = **461**

2: 455 − 317 = **138**

3: 861 − 732 = **129**

4: 413 − 152 = **261**

Add and Subtract within 1,000

Independent Practice Worksheet Session 1

Name: _____ **Date:** ___/___/___

Student Tip!

When using a number line to add,

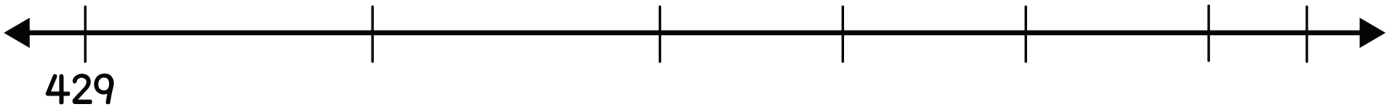
- Start by placing the first number on the left.
- Jump forward to the right by the hundreds, then the tens, then the ones in the second number.

When using place value with partial sums to add,

- Break apart each number by place value.
- Add the hundreds, tens, and ones separately.
- Combine the partial sums.

1. Solve 132 + 559.
   a. 681
   b. 781
   c. 791
   d. 691

2. Complete the number line to solve 429 + 231.



3. Find the sum: 382 + 435.

382 = _____ + _____ + _____ 435 = _____ + _____ + _____

Hundreds: _____ + _____ = _____

Tens: _____ + _____ = _____

Ones: _____ + _____ = _____

Sum of 382 + 435 = _____ + _____ + _____ = _____

Add and Subtract within 1,000

Independent Practice Worksheet Session 2

Name: _____ **Date:** ___/___/___

Student Tip!

When using a number line to subtract,

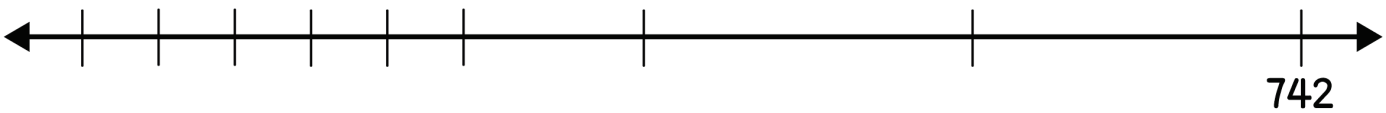
- Start by placing the first number on the right.
- Jump back to the left by the hundreds, then the tens, then the ones in the second number.

When using place value with partial differences to subtract,

- Break apart the second number by place value.
- Subtract the hundreds, then subtract the tens, then subtract the ones.

1. Solve 896 – 323.
   a. 463
   b. 573
   c. 473
   d. 563

2. Complete the number line to solve 742 – 215.



3. Find the difference: 857 – 145.

Break apart second number: 145 = _____ + _____ + _____

_____ – _____ = _____

_____ – _____ = _____

_____ – _____ = _____

Add and Subtract within 1,000

Independent Practice Answer Key

Session 1

1: d. 691

2: 429 + 231 = 660

3: 382 + 435 = 817

Session 2

1: b. 573

2: 742 − 215 = 527

3: 857 − 145 = 712