

## General Information

### Lesson Parts & Duration

Total Duration: 1 hour

- Addition and Subtraction Within 1000 Using Open Number Lines and Counting Up

### Subject(s)

- Adding and Subtracting Within 1000; Expanded Form, Value of Digits, Counting Up and Open Number Lines (3.NBT.2).

### Objective

- Students will add within 1000 using open number lines.
- Students will subtract within 1000 using open number lines.

### Materials

- blank paper
- pencil & crayons/colored pencils
- document camera or whiteboard
- **Optional Printable Student Resources:** “Exit Slips” (page 7) (1 copy per student), “Adding and Subtracting: Open Number Lines Practice” (page 8) (1 copy per student), “Adding and Subtracting Within 1000: Open Number Lines” (page 9) (1 copy per student)
- **Optional Printable Teacher Resources:** “Adding and Subtracting: Open Number Lines” notes (page 10) (1 copy to project for class to see), “Break Up Your Day” brain/movement break ideas (page 11)

### Throughout this lesson, you will find:

- ☀ **Scripted Text** indicates things that need to be said directly. Bullets starting with a “T” followed by *italicized type* indicate scripted text
- ☀ **Clarifiers** within scripted text are in orange
- ☀ **Teacher Directions** indicate things you should be doing
- ☀ **Side notes** provide helpful hints, ELL strategies, differentiation and information
- ☀ **Break Up Your Day** (Brain/Movement Breaks) are in green boxes (at the end)

### Remember!

Quality over quantity. All components do not have to be accomplished; lessons may be ended at any time and resumed later.

## Instructional Plan: 60 minutes

### Introduction

- T* When I say “Go!” I would like everyone to please stand up and stand on one side of the room, but not until I say, “Go!” please listen first.
- T* I would like each of you to get to the other side of the room by hopping.
- T* Just like a frog or a bunny hops.
- T* Here is the catch.
- T* I want you to count in your head how many “hops” it takes you to get from one side of the room to the other.
- T* Please do not count out loud because it will be hard for everyone to count correctly if everyone is saying different numbers.
- T* Ok, “Go!” Please walk quickly and quietly. Then stand on one side of the room.

### Provide time for students to all be standing on one side of the room.

- T* When I say, “hop” you will begin hopping and counting in your head until you reach the other side of the room.
- T* Give me a thumbs up if you understand what to do. Clarify the process again if anyone seems confused.
- T* Ready, “HOP!”

### Provide time for students to hop to the other side of the room. Monitor and remind students to hop safely and count in their heads.

- T* Don't forget your final number of hops!
- T* Great work little hoppers!
- T* If you could please walk back to your seats quickly and quietly.
- T* Let's record the class data you just collected.
- T* I will title my data sample as: “Hops Across the Room.”
- T* I will go around the room and collect how many hops it took each of you to get across the classroom.
- T* If someone else has the same number of hops as someone who has already shared, I will put a checkmark next to that number so we know how many of you had each number.
- T* If the number has no checkmarks next to it, we will know only one of you had that number. Call on each student to share their number of hops. Record it on a chart or the board. Use checkmarks for duplicate answers.
- T* Wow some of you took a lot of hops! Take a moment to look at the data I have just recorded. What are some things you notice? Call on students to share. Possible Answers: identify the maximum number of hops, identify the minimum number of hops, identify what numbers were most common or least common.
- T* Did you all hop across the same room?
- T* Did you all take the same path or route to get from one side to the other?
- T* But did you all get from one side to the other?
- T* You all had the same task or problems, but you got there in a different way.

### Whole Group Setting up the Paper

- T* Today we will be using an Open Number Line to help us solve addition and subtraction problems.
- T* We will start by taking some notes so that we have examples and steps to refer back to later if we get confused.

Pass out preprinted notes -or- project the notes for students to copy. Project the notes on the board for students to see as you read them.

**T** Please write your name and date in the top right hand corner. See example and model this step for students to copy.

**T** We will title these notes: "Adding and Subtracting: Open Number Lines." See example and model this step for students to copy.

Name & Date

Adding and Subtracting: Open Number Lines

**T** Then we will write our learning target, which is: "I can add and subtract within 1000 using open number lines." See example and model this step for students to copy.

I can add and subtract within 1000 using open number lines.

**ADDING**

**T** The first thing we will do is to draw out an open number line. See example and model this step at the bottom of the page for students to copy.

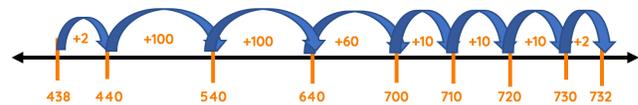
1. Draw out an open number line.
2. On the left side, draw a tick mark and write the first number, 438.
3. Then you need to "hop" down the number line the second number of times, 294.
4. You can choose what increments or sizes to hop. **Example:** 1s, 2s, 5s, 10s, or 100s
5. Start by getting to a landmark number, like the nearest 10. **Example:** 440 is the nearest 10.
6. Record underneath your hops "+2" or whatever size your hop is.
7. Keep hopping until the number of hops adds up to the second number in your equation. **Example:** 294

**T** On the left side, draw a tick mark and write the first number, 438. See example and model this step at the bottom of the page for students to copy.

Keep Track of hops:  $2 + 100 = 102 + 100 = 202 + 60 = 262 + 10 = 272 + 10 = 282 + 10 = 292 + 2 = 294$

$$438 + 294 = 732$$

**T** Then you need to "hop" down the number line the second number of times, 294.



**T** You can choose what increments or sizes to hop. Example: 1s, 2s, 5s, 10s, or 100s.

**T** Start by getting to a landmark number, like the nearest 10. Example: 440 is the nearest. See example and model this step at the bottom of the page for students to copy.

**T** Record underneath your hops "+2" or whatever size your hop is. See example and model this step at the bottom of the page for students to copy.

**T** It is helpful to hop first to a landmark number so that your hops after it are easier to add.

**T** Each time I hop, I will make a new tick mark and below it record what number I hopped to.

**T** Keep hopping until the number of hops adds up to the second number in your equation. Example: 294. See example and model this step at the bottom of the page for students to copy.

**T** First, I hopped 2, I still have to hop 292 more.

**T** Since there are 2 hundreds in the number 294 I will hop by hundreds next.

**T** I will make 1-hundred hop.

**T** Then write a new tick mark with the number 540 because  $440 + 100 = 540$ .

**T** Now I still need to hop 192 more.

**T** I will make another 1-hundred hop.

**T** Then record a tick mark with 640 because  $540 + 100 = 640$ .

**T** Now I have 92 hops to go.

**T** You may be thinking, just hop 92 and we are done.

**T** We could, however, it would be hard for me to add  $640 + 92$  in my head.

**T** So I am going to think of what big landmark number I might hop to.

**T** I know that  $40 + 60 = 100$ , so what if I hop 60 and go from 640 to 700?

**T** That would mean I have hopped 262 times. I need to hop 294 times.

**T** Let's try hopping by 10's I don't want to hop too big and then pass my target number of hops.

**T** To get to the 90's how many times do I need to hop by 10s from 60.

**T** Let's count 60, 70, 80, 90. So I need 3 hops by 10.

**T** So my tick marks will be 710, 720, 730.

**T** Now I have hopped 292 times.

**T** How many more hops do I need to reach 294? **Answer: 2 hops**

**T** Correct, I need to hop by 2.

**T** Now I can go back and add up all of my hops to make sure that I hopped 294 times.

**T** If my number of hops is correct, then my answer is 732!

- T* While I was hopping, you may have been thinking of different amounts that I could have hopped.
- T* Just like when we hopped across the room.
- T* There is not one right solution.
- T* You will see later when we start to practice, we will all get the same answer to our addition or subtraction equations, but we may all get there in different ways!

Provide time for students to complete this example. Monitor and provide assistance as needed.

## Subtraction on an Open Number Line

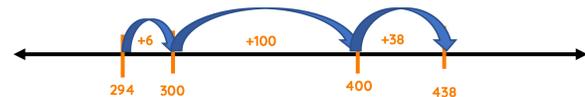
- T* Let's flip our papers over to the backside and write the steps for subtraction and write an example problem.
- T* Many people like to use what is called, the "Counting Up" strategy when showing subtraction on a number line.
- T* You could hop backwards and count back.
- T* But for today we will all practice counting up. Project the notes on the board for students to see as you read them.
- T* Just like addition we will start by drawing out an open number line.
- T* When subtracting, we will put the first number, in our equation, the larger number, 438 on the right side of the line. See example and model this step at the bottom of the page for students to copy.
- T* Then we put second number in our equation, the smaller number, 294 on the left. See example and model this step at the bottom of the page for students to copy.
- T* In subtraction, we want to find the difference.
- T* How many numbers are between these two numbers on a number line? Motion on the number line between those two numbers to help them see there is space between the two numbers.
- T* Starting at the smaller number, you need to "hop" down the number line to the larger number, 438.
- T* You can choose what increments or sizes to hop. Example: 1s, 2s, 5s, 10s, or 100s.
- T* We will start by getting to a landmark number, like the nearest 10. Example: 300 is the nearest 10.
- T* So, on our number line let's hop and put a tick mark and underneath it write 300. See example and model this step at the bottom of the page for students to copy.
- T* Record underneath your hops "+6" or whatever size your hop is.
- T* Now we need to keep hopping until we reach our final number, 438.
- T* Finally, add up all of your hops.
- T* All of your hops added together is the distance between the two numbers and your answer!
- T* My first hop was 6 and that brought me to 300.
- T* I still need to hop to 438. 400 is 100 more than 300.
- T* I will do a big hop 100.
- T* My new tick mark is 400.
- T* Now I need to get 38 more, to get to 438.
- T* So, I will just make one big hop to 38.
- T* I could also hop 3 tens and then 8 more.
- T* Finally, I need to add up all of my hops!
- T* I hopped 6 and then 100 and then 38 more. So, "6 + 100 + 38 = 144."
- T* Then that is the answer to our subtraction problem, "438 - 294 = 144."

### SUBTRACTING: Counting Up Method

1. Draw out an open number line.
2. When subtracting, we will put the first number, in our equation, the larger number, 438 on the right side of the line.
3. Then we put second number in our equation, the smaller number, 294 on the left.
4. In subtraction, we want to find the difference. How many numbers are between these two numbers on a number line.
5. You need to "hop" down the number line to the larger number, 438.
6. You can choose what increments or sizes to hop. **Example:** 1s, 2s, 5s, 10s, or 100s
7. Start by getting to a landmark number, like the nearest 10. **Example:** 300 is the nearest 10.
8. Record underneath your hops "+6" or whatever size your hop is.
9. Keep hopping until you reach your final number, 438.
10. Finally, add up all of your hops.
11. All of your hops added together is the distance between the two numbers and your answer!

Keep Track of Hops:  $6 + 100 + 38 = 144$

$$438 - 294 = 144$$



- T* Just like with our addition problem you may have thought of other ways to hop.
- T* Now we will try a few more together.
- T* Then we will do a few where each of you will solve equations and then we will compare all of the different solutions you come up with to solve the same equations.

Pass out “Adding and Subtracting: Open Number Lines Practice” -or- project for students to copy on blank paper.

Complete #1 & #5 as a whole group example.

**Differentiation:**

**Support:** work problem by problem giving students a chance to offer suggestions of how to hop to solve the problems and complete as a whole group

**Enrichment:** if they all seem to be understanding, give them all time to solve one problem. Then bring the class back together to share and compare solutions.

Name: **ANSWER KEY**

**Adding and Subtracting: Open Number Lines Practice**

1.  $419 + 294 =$
2.  $623 + 46 =$
3.  $629 + 289 =$
4.  $336 + 209 =$
5.  $920 - 806 =$
6.  $681 - 552 =$
7.  $212 - 102 =$
8.  $380 - 118 =$
9. Marcia weighed 110 pounds, her little sister Tricia weighed 56 pounds, and their baby brother Timmy weighed 25 pounds. How much did they weigh in all?

Name: **ANSWER KEY**

**Adding and Subtracting Within 1000: Open Number Lines**

Hops will vary based on the increments student choose.

1.  $765 + 218 = 983$
2.  $555 + 207 = 762$
3.  $737 + 143 = 880$
4.  $633 + 219 = 852$
5.  $995 - 846 = 149$
6.  $347 - 239 = 108$
7.  $861 - 102 = 759$
8.  $445 - 228 = 217$
9. Phil went to the store and bought bag with 375 pieces of candy in it to pass out to his friends. He only gave away 162 pieces. How many pieces did he have left?  
 $375 - 162 = 213$  pieces of candy

**Partner Practice**

Pass out “Adding and Subtracting Within 1000: Open Number Lines” -or- project for students to copy on blank paper.

- T* Now you will finally have the chance to solve some more with a partner!
- T* It is ok if you and your partner want to write down different solutions.
- T* The goal is getting the correct answer.

If time bring the class back together and call students up to fill in their answers to each problem. Correct and clarify as needed if a student has the wrong answer and they are sharing it with the class.

### Optional Assessment Component Exit Slip

\*You may use the exit slip at the end of this lesson as a quick assessment of student understanding. Either print them out (page 7), or simply have students copy the problems on a half sheet of paper.

Name: **ANSWER KEY** Date: \_\_\_\_\_

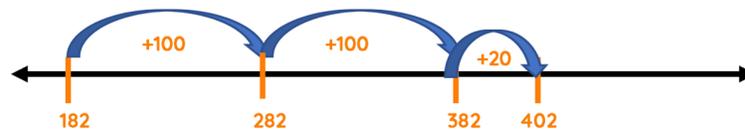
#### Exit Slip:

Addition and Subtraction Using Open number lines

**Directions:** Solve the addition and subtraction problems using hops on a number line.

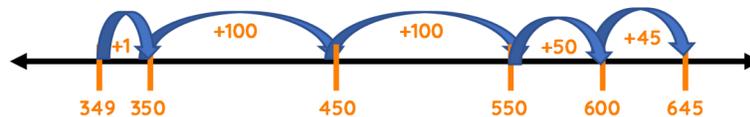
The answers below are one possible answer showing the format students should follow. Answers will vary based on the solutions students choose.

1.  $182 + 220 = 402$



$$182 + 100 = 282 + 100 = 382 + 20 = 402$$

2.  $645 - 349 = 296$



$$1 + 100 + 100 + 50 + 45 = 296 \quad 645 - 349 = 296$$

 **Make sure to “Break Up Your Day!”** 

Now is a great time to take a break and get students re-energized. See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 11)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Exit Slip:**

Addition and Subtraction Using Open number lines

**Directions:** Solve the addition and subtraction problems using hops on a number line.

1.  $182 + 220 =$



2.  $645 - 349 =$



Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Exit Slip:**

Addition and Subtraction Using Open number lines

**Directions:** Solve the addition and subtraction problems using hops on a number line.

1.  $182 + 220 =$



2.  $645 - 349 =$



Name: \_\_\_\_\_

**Adding and Subtracting: Open Number Lines Practice**

1.  $419 + 294 =$



2.  $623 + 46 =$



3.  $629 + 289 =$



4.  $336 + 209 =$



5.  $920 - 806 =$



6.  $681 - 552 =$



7.  $212 - 102 =$



8.  $380 - 118 =$



9. Marcia weighed 110 pounds, her little sister Tricia weighed 56 pounds, and their baby brother Timmy weighed 25 pounds. How much did they weigh in all?



Name: \_\_\_\_\_

**Adding and Subtracting Within 1000: Open Number Lines**

1.  $765 + 218 =$



2.  $555 + 207 =$



3.  $737 + 143 =$



4.  $633 + 219 =$



5.  $995 - 846 =$



6.  $347 - 239 =$



7.  $861 - 102 =$



8.  $445 - 228 =$



9. Phil went to the store and bought bag with 375 pieces of candy in it to pass out to his friends. He only gave away 162 pieces. How many pieces did he have left?

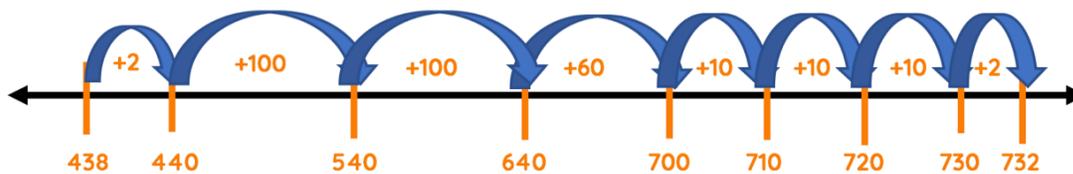


## ADDING

1. Draw out an open number line.
2. On the left side, draw a tick mark and write the first number, 438.
3. Then you need to “hop” down the number line the second number of times, 294.
4. You can choose what increments or sizes to hop. **Example:** 1s, 2s, 5s, 10s, or 100s
5. Start by getting to a landmark number, like the nearest 10. **Example:** 440 is the nearest 10.
6. Record underneath your hops “+2” or whatever size your hop is.
7. Keep hopping until the number of hops adds up to the second number in your equation. **Example:**  
294

Keep Track of hops:  $2 + 100 = 102 + 100 = 202 + 60 = 262 + 10 = 272 + 10 = 282 + 10 = 292 + 2 = 294$

$$438 + 294 = 732$$

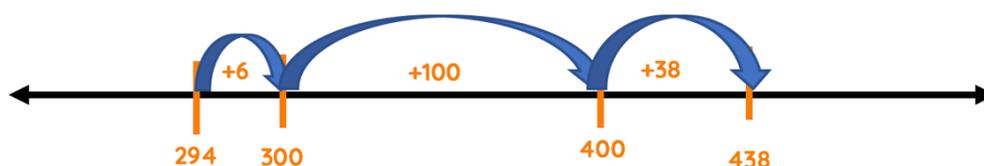


## SUBTRACTING: Counting Up Method

1. Draw out an open number line.
2. When subtracting, we will put the first number, in our equation, the larger number, 438 on the right side of the line.
3. Then we put second number in our equation, the smaller number, 294 on the left.
4. In subtraction, we want to find the difference. How many numbers are between these two numbers on a number line.
5. You need to “hop” down the number line to the larger number, 438.
6. You can choose what increments or sizes to hop. **Example:** 1s, 2s, 5s, 10s, or 100s
7. Start by getting to a landmark number, like the nearest 10. **Example:** 300 is the nearest 10.
8. Record underneath your hops “+6” or whatever size your hop is.
9. Keep hopping until you reach your final number, 438.
10. Finally, add up all of your hops.
11. All of your hops added together is the distance between the two numbers and your answer!

Keep Track of Hops:  $6 + 100 + 38 = 144$

$$438 - 294 = 144$$



## Make sure to “Break Up Your Day!”

These can be used in the middle of a lesson or at the end of your lesson.  
Here are a few engaging movement and brain break ideas to get your students moving and ready to refocus!



### Break Up Your Day: Guess My Number!



- Begin by showing an example:
- “I am thinking of a number between 1 and 10. Who would like to guess my number” Call on a student.
- When they take a guess, let them know if your number is bigger or smaller than what they guessed (ex: Student guesses 5, your number is 7, so you would say “My number is bigger than 5.” Then call on another student to guess).
- Keep giving clues until students guess the number.
- You could play again with the teacher picking the number if students need reinforcement, or you could have a student come up and pick the number (have them tell you what the number is so you can help them).



### Break Up Your Day: The Wiggles!



- Let’s get our wiggles out before we continue!
- Stand up and shake out your arms (4-5 seconds to shake) Remember! No one should get hurt! ...now FREEZE!
- Now shake the wiggles out of your right leg...FREEZE!
- Now shake the wiggles out of your left leg...FREEZE!
- Now shake all the wiggles out of your whole body...FREEZE!



### Break Up Your Day: Body Stretches!



**10 minutes**

**FORMATION:** Standing at desks

- Have students begin the day with a series of simple activities lasting 30 seconds or more: jumping jacks, knee lifts, flap arms like a bird, hopping, scissors (feet apart then cross in front, feet apart then cross in back)...
- Follow each activity with a basic stretching movement:
- Reach for the sky runner’s stretch
- Butterfly stretch (sit with bottom of feet together)
- Knee to chest, rotate ankles, scratch your back

**Hold stretches for 10 - 30 seconds. Repeat a different simple activity followed by a new basic stretch as many times as desired.**