Grade Level/Course:
1st grade- 2nd grade

Lesson/Unit Plan Name:
Adding and Subtracting within 100

Rationale/Lesson Abstract:
Students use number lines, decomposition and "Make a Ten" strategy to add and subtract within 20. Once they have experience and understanding with smaller numbers, they can use all the same strategies to add within 100.

Timeframe:
3-4 days for Making a Ten lessons
5 + days for Adding within 100

Instructional Resources/Materials:
White boards, white board markers, paper and colored pencils, counters (optional)

Common Core Standards:
1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making a ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier or known sums.

1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Prerequisites:
Students should have lots of concrete experience using manipulatives to make a ten before they do this series of lessons.
Example: Use two side by side ten frames to add 9 + 5. Students should use counters to model the problem on their ten frames and then practice moving one counter from the 5 to the 9 to make a complete 10. Students should understand they created 10 + 4 by moving one up.
Example: Use unifix cubes to model 9 + 5. Students can create a tower of 9 and a tower of 5. Guide students to make a ten by taking off one cube from the 5 tower and adding it to the 9 tower to make a 10.

Students should have lots of concrete experience adding 2 digit numbers using base ten models before they move on to this lesson. This lesson would be considered a semi-concrete experience for 1st graders.

This lesson builds on all of these concrete experiences.

Activity/Lesson: <u>Part 1- Adding/Subtracting within 20</u>

Review all the sums for 10 with students. Teacher can generate a list to keep on the board.

9 + 1
8 + 2
7 + 3
6 + 4
5 + 5

It is so much easier to add with tens than other numbers.
"What is 10 + 5?" *Students chorally respond with answers at a quick pace.*
"What is 10 + 9?"
"What is 10 + 4?"
"What is 10 + 2?"
"What is 10 + 6?"
"What is 8 + 6?" *Students probably won't answer this one as fast.*

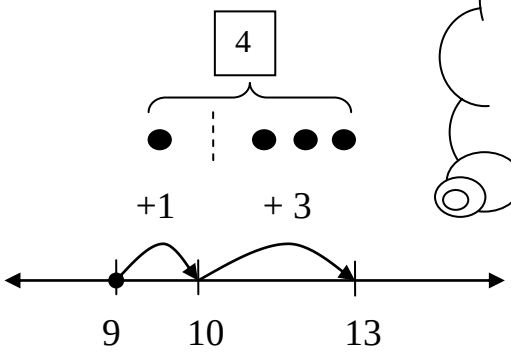
The last one took longer than all the others because it is so much easier to add with 10.
We can move numbers around in our equations to help us make 10 and add more efficiently.

<u>Teacher Model: Addition</u>

9 + 4 = ☐

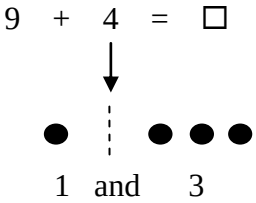
Which number is easiest to make a ten? *9 because it is closest to 10.*
Let's decompose (break apart) the four so we can give one to the nine and make a ten. Draw 4 dots under the 4 and show students how you can draw a line between the 1 and the 3 to decompose 4.
"Now I can give one from the four to the nine to make a ten"

Semi-concrete representation

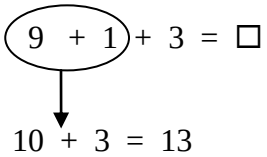


I can decompose 4 into 3 and 1. I do this because I need one more to make a 10 with 9.

Abstract representation



"Now I have 3 addends instead of 2"

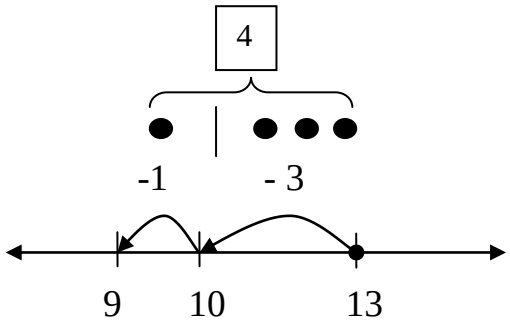


∴ 9 + 4 = 13

Teacher Model: Subtraction

13 - 4 = ☐

"*If I decompose and subtract to 10, it is easier to find the answer."*



∴ 13 – 4 = 9

Guided Practice and You Try:
Students can use white boards to practice. Teacher can decide how many to do together, with partners and/or independently.

Use all equations adding with 9. Practice making a 10 with 9 and guide students to understand that each time they add with 9, they are always moving 1 from the other addend to make a 10. When doing subtraction, students decompose to subtract back to 10.

9 + 6 = ☐	15 - 6 = ☐
*3 + 9 = ☐	12 - 3 = ☐
9 + 8 = ☐	17 - 8 = ☐
*7 + 9 = ☐	16 - 7 = ☐

**Students should practice analyzing each addend to see which number would be easiest for them to make a ten. Don't give all examples where the greater number is in the front. They may need to be reminded of the commutative property of addition.*

Go through the same process with equations adding with 8. How many do they need to make a 10 each time they add with 8? *They will always be moving 2 from the other addend to make a 10 with 8.*

When doing subtraction, students decompose to subtract back to 10.

8 + 3 = ☐ 11 - 3 = ☐

7 + 8 = ☐ 15 - 7 = ☐

8 + 9 = ☐ 17 - 9 = ☐

5 + 8 = ☐ 13 - 5 = ☐

Go through the same process with equations adding with 7. How many do they need to make a 10 each time they add with 7? *They will always be moving 3 from the other addend to make a 10 with 7.*

When doing subtraction, students decompose to subtract back to 10.

6 + 7 = ☐ 13 - 6 = ☐

7 + 7 = ☐ 14 - 7 = ☐

7 + 5 = ☐ 12 - 5 = ☐

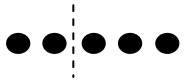
4 + 7 = ☐ 11 - 4 = ☐

Alternate practice:

Pair students up and give each one a different colored pencil. The partners will work together to find the sum. Use some of the equations above and have each student take turns jumping on the number line to add using their own colored pencil. Students may use the Make a Ten strategy to help solve. However, students can make any sized jumps they would like.

Example:

8 + 5 = ☐

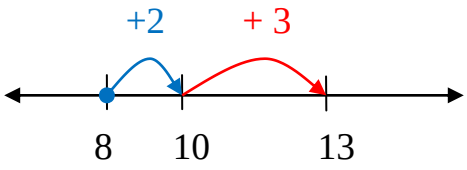


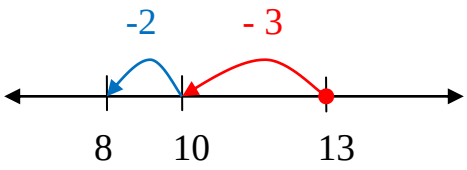
2 and 3

(8 + 2) + 3 = 13

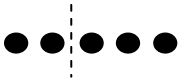
10 + 3 = 13

∴ 8 + 5 = 13





13 – 5 = ☐



2 and 3

13 – 3 = 10

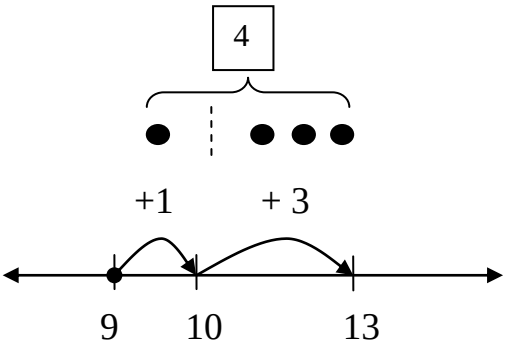
10 – 2 = 8

∴ 13 – 5 = 8

Activity/Lesson: <u>Part 2 - Adding within 100</u>

Teacher Model: Addition with 2 digits and 1 digit
Connect student learning to previous knowledge about adding into the teens by making a ten.

If I know…
9 + 4

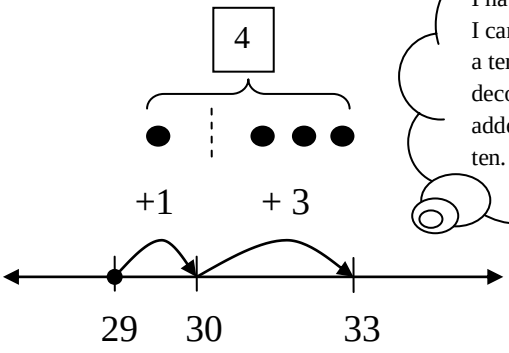


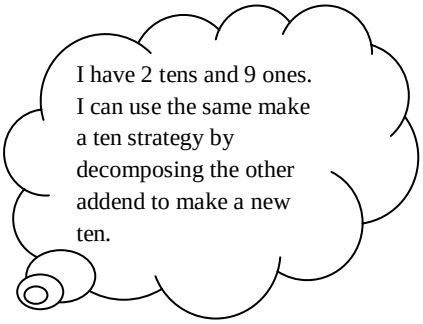
(9 + 1) + 3 = ☐

10 + 3 = 13

∴ 9 + 4 = 13

then I know…….
29 + 4





(29 + 1) + 3 = ☐

30 + 3 = 33

∴ 29 + 4 = 33

Ask students how 9 + 4 and 29 + 4 are alike and different. Students might say they both have 9 and 4 in them, but one of the problem has a 2. Clean up the language for them:
"Yes, in both problems we are adding 9 ones and 4 ones, but in 29 + 4 we have 2 extra tens."

Solve these with the students and continue to point out the repeated structure:

39 + 4 = ☐
49 + 4 = ☐

<u>Guided Practice and You Try:</u>
Students can do these in partners or independently, depending on the needs of each student. Students could also use the colored pencils and "share the work" by taking turns jumping on the number line to reach the sum.

9 + 6 = ☐
19 + 6 = ☐
29 + 6 = ☐
39 + 6 = ☐

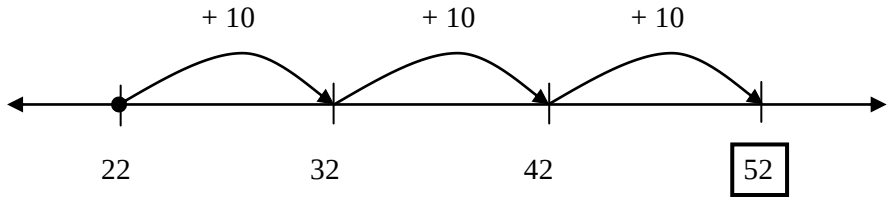
8 + 7 = ☐
18 + 7 = ☐
48 + 7 = ☐

Teacher Model: Adding with Tens

Once students understand adding one digit numbers to two digit numbers, they can explore adding 2 digit numbers and 2 digit numbers. Students should start out by adding a two digit number with multiples of 10.

22 + 30 = ☐

Show students how to decompose 30 into 10 + 10 + 10 and how to jump by tens on the number line to find the answer.



Guided Practice and You Try:

Students should practice solving 2 digit numbers with multiples of 10. Use the practice sheet at the end of the lesson. Students can solve these equations independently or in partners, working together by taking turns with their colored pencils to make jumps and find the sum. Students should have a good grasp of adding with tens before they go to the next step.

Teacher Model: Adding 2 digits numbers:

25 + 13 = ☐

Students can decompose 13 many different ways. Help students create a list of different ways to decompose 13. Students can use counters or draw pictures to help in this process. Students should see that one way of decomposing the addend is by using expanded form (breaking into tens and ones)

10 + 3

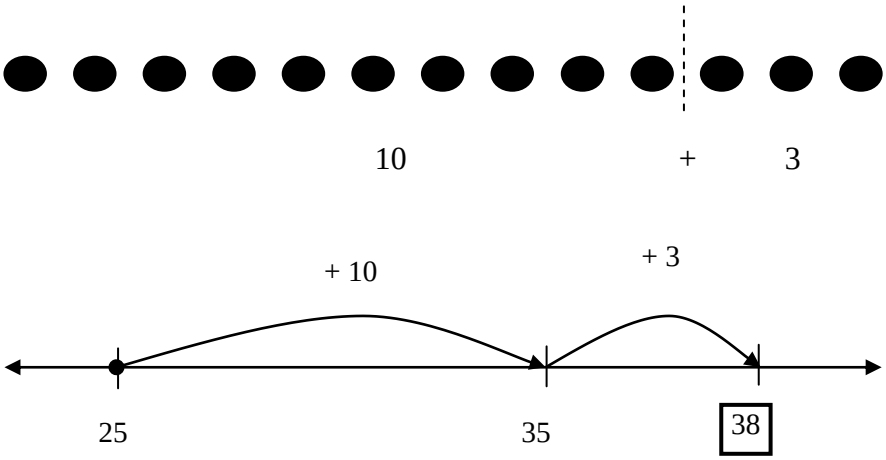
Or

5 + 5 + 3

Or

10 + 1 + 1 + 1

Example: Show students one way to decompose 13 and add on a number line. They can use counters and decompose 13 into groups using popsicle sticks or they can draw dots and decompose 13 by using lines to divide the dots into groups.



Show students how to add 25 + 13 on a number line a few different ways so they understand they can arrive at the same answer several ways.

Guided Practice and You Try:

Have students choose one addend to decompose and add on the number line.

13 + 22 = ☐ 26 + 12 = ☐

17 + 21 = ☐ 23 + 15 = ☐

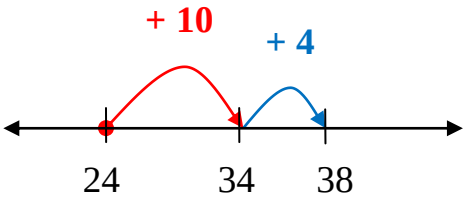
Alternate Practice:

Students should work in partners. Each partner has a different colored pencil. Use practice sheet at the end of the lesson.

Example: 14 + 24 = ☐

Partner A decomposes: 14 = 10 + 4

Partner B begins the first jump on the number line (**+ 10**)
Partner A adds to next jump (**+ 4**)



Partners should switch roles for each turn.

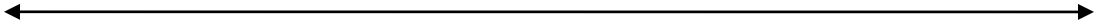
Assessment:

Solve using a number line:

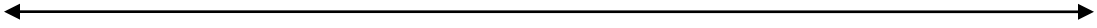
8 + 4 = ☐

18 + 4 = ☐

21 + 20 = ☐



16 + 32 = ☐



Adding with Tens

34 + 20 = ☐

12 + 30 = ☐

40 + 28 = ☐

Adding 2 Digit Numbers:

16 + 23 = ☐

27 + 11 = ☐

24 + 16 = ☐