CHAPTER 4: Addition and Subtraction of Two-Digit Numbers MINI-MODULE A

Developing Strategies for Two-Digit Addition and Subtraction

Objectives

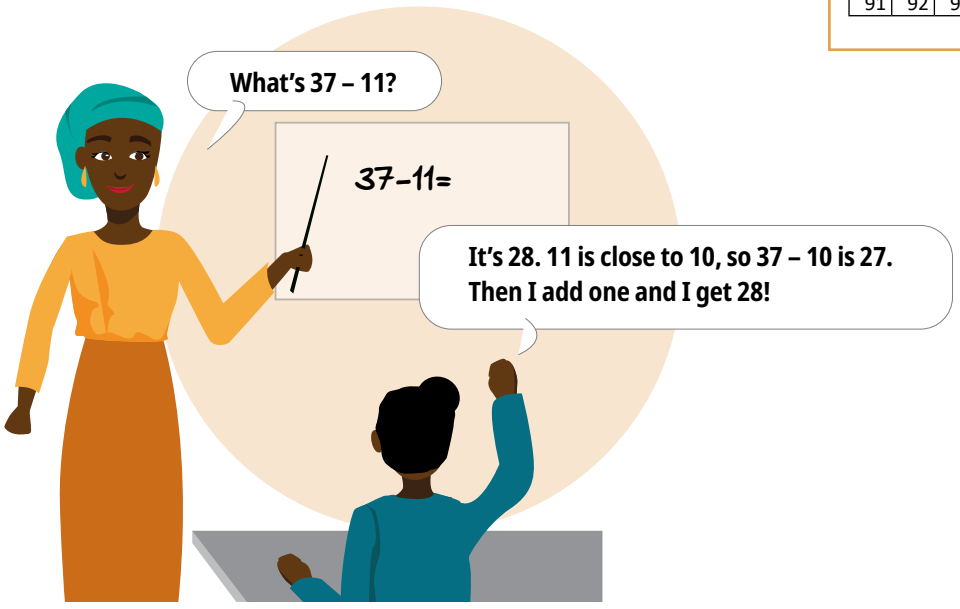
This mini-module aims to help teachers:

- Demonstrate how to add and subtract two-digit numbers using a variety of strategies.
- Teach two-digit addition and subtraction using materials and writing.
- Practice a new teaching activity.

Recommended Materials

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Illustration of Teaching



REFLECT:

- What mistake did the student make?
- Why do you think the student made this mistake?
- What materials could you use to address this misunderstanding?
- What questions could you ask this student to help them understand?

Ideas to Consider

The student was able to use strategies to subtract two two-digit numbers. The student understood that 11 is one more than 10 and that 10 is an easier number to subtract. The student made a mistake in adding 1 to the 27, instead of subtracting it. Since the number to subtract was 11, the student needs to subtract 10 and then subtract 1. The teacher could use a 100 chart to visually show the student how to subtract 10 and then subtract 1. The teacher can also ask the student to try to solve the problem using another strategy, such as subtracting the tens and then the ones.

ACTIVITY: USE THE 100 CHART TO SOLVE ADDITION PROBLEMS

This activity can be completed alone, in pairs, or with a group of teachers. You may prepare a 100 chart for each colleague ahead of time. Discuss your responses to the questions.

Purpose: Use the 100 chart to add two-digit numbers.

Materials needed: 100 chart

Instructions

- Write the problem: 21 + 15 =
- ***How can we solve this problem using the 100 chart?***
- Show and explain how to add 21 + 15 with the 100 chart. Note that 15 = 10 + 5. Below, 10 is added first, then 5.

Start at 21.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Add 10, which is one row below on the 100 chart. This brings you to 31.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Count 5 more: 32, 33, 34, 35, 36. 21 + 15 = 36

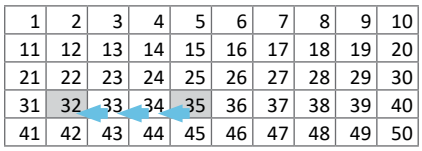
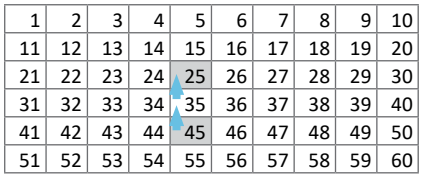
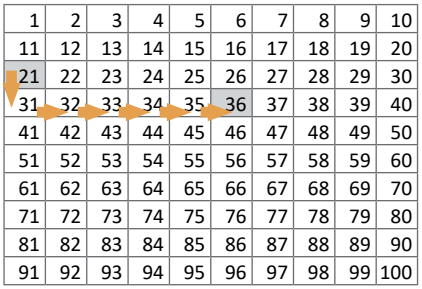
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

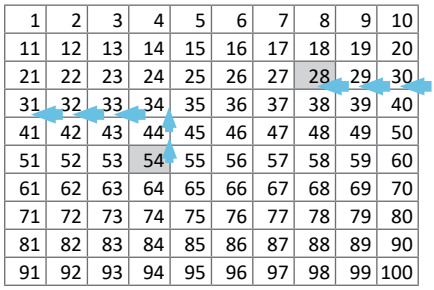
- Take turns using the 100 chart to solve problems like 45 + 32, 56 + 21, and 14 + 67. Practice explaining the steps to solve the problem while modeling on the 100 chart.

What Do Children Learn about Strategies to Solve Addition and Subtraction Problems?

Before learning about the standard algorithm for addition and subtraction of two-digit numbers, children should have opportunities to solve these problems using other strategies, such as by composing and decomposing numbers and using multiples of 10. These strategies can be taught using materials and pictures—such as the 100 chart, number lines, and pictures—to help visualize strategies. If children can use multiple strategies to solve problems first, they will have a stronger foundation for learning vertical addition and subtraction with regrouping. In addition, children who can use different strategies depending on the problem are more likely to do well in more advanced mathematics.

When solving addition and subtraction problems, children may use a single strategy from the table below, or a combination of different strategies. They should be encouraged to choose or create their own strategies.

Children should be able to . . .	What does this mean?	Example
Add and subtract by counting up or backward	Add by counting up from a number by a smaller number. Subtract by counting back from a larger number by a smaller number.	Q: ***What is 56 + 5?*** A: I count up 5 from 56: 57, 58, 59, 60, 61. So, 56 plus 5 is 61. Q: ***What is 35 – 3?***  A: I count back 3 from 35: 34, 33, 32.
Add and subtract multiples of 10	Add or subtract a multiple of 10.	Q: ***What is 24 + 10?*** A: I can count by tens: 24, 34. 24 plus 10 is 34. Q: ***What is 45 – 20?***  A: I can use a 100 chart. I start at 45, then count back by two tens to 35, then 25. 45 minus 20 is 25.
Add using a 100 chart	Use the 100 chart to add two-digit numbers.	Q: ***What is 21 + 15?*** A: I start at 21. I know 15 is 10 plus 5. I count up 10 from 21, to 31. Then I count up 5 more from 31: 32, 33, 34, 35, 36. 21 + 15 = 36 

Children should be able to . . .	What does this mean?	Example
Subtract using a 100 chart	Use the 100 chart to subtract two-digit numbers.	Q: ***What is 54 – 26?***  A: I start at 54. I know 26 is 20 plus 6. To subtract 20, I count backward by tens from 54: 44, 34. Then I need to count 6 back from 34: 33, 32, 31, 30, 29, 28. 54 – 26 = 28
Add by composing and decomposing	Use composing and decomposing to add two-digit numbers.	Q: ***What is 44 + 35?*** A: I can break down 35 to 30 plus 5. First I add 44 + 30, which is 74. Then I add 74 + 5, which is 79. 44 + 35 = 79
Subtract by composing and decomposing	Use composing and decomposing to subtract two-digit numbers.	Q: ***What is 38 – 23?*** A: I can break down 23 to 20 plus 3. First I subtract 20 from 38 to get 18. Then I count back 3 more, to 15. 38 – 23 = 15

Reflection

Write your responses down or discuss your ideas with your colleagues:

- Imagine that you ask your students to solve the problem 44 – 32 using any strategy.
  - » What strategies might they use?
  - » How does using these strategies help them understand how to subtract two-digit numbers better?
- How would you support students in being able to explain their strategies?
- How would you teach students new strategies?

Teaching Practice

This practice activity may be completed by teachers with their own class or with a smaller group of students.

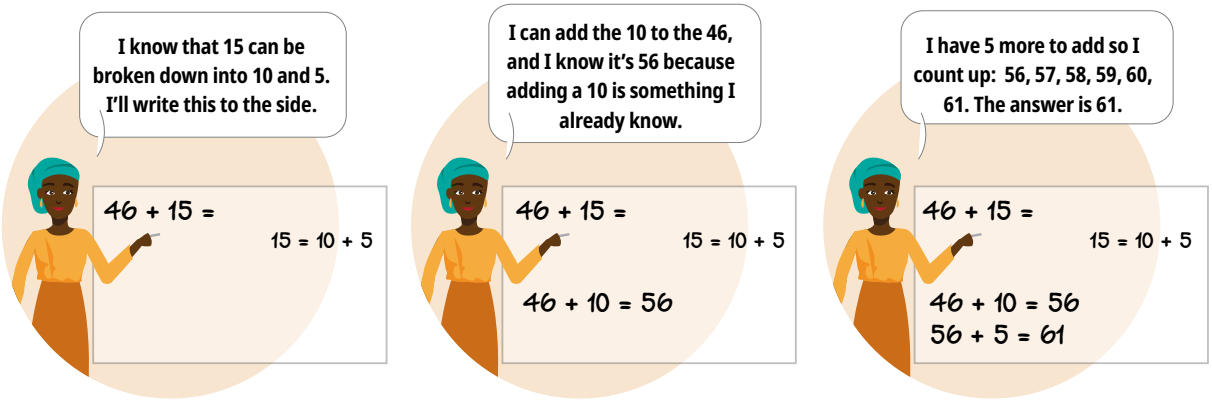
ACTIVITY: ADD USING COMPOSING AND DECOMPOSING

Purpose: Solve two-digit addition problems using composing and decomposing.

Materials needed: Writing materials for students.

Instructions

- Write a problem on the board: 46 + 15
- Say: ***I am going to share one way to solve this problem: by breaking numbers into parts.***
- Explain the steps and use the board to keep track of what you are doing.



- Write the answer to the original problem on the board: 46 + 15 = 61
- Tell students that now they will try to solve a problem the same way.
- Write a new problem on the board: 37 + 14
- Give students three to four minutes to solve the problem independently.
- Ask students to share with a partner their answer and an explanation of how they solved the problem. (Some students may use other strategies, such as counting up or the 100 chart, if you previously introduced these strategies. Encourage all students to explain their strategy.)

The answer is 51. I know that 14 is 10 + 4. 37 plus 10 is 47. Then I count up 4: 48, 49, 50, 51.

I know that 37 is 30 plus 7. I added 30 + 14 to get 44, then counted up 7 more: 45, 46, 47, 48, 49, 50, 51.

- Explain how to solve the problem. Ideally, show two different ways to solve the problem so that children know there is more than one right way.
- Say: ***Let's practice solving more problems using a strategy. Remember, you can use the strategy we just learned or another strategy you have learned before.***
- Write more two-digit addition problems on the board. For example: 34 + 16, 22 + 19, and 12 + 87.
- Encourage students to solve the problems and explain how they solved the problems to a partner.

MAY 2025

AUTHORS: Brittany Meredith, Yasmin Sitabkhan, Wendi Ralaingita, Linda Akach