Understand the Digits of Numbers

Objectives

This mini-module aims to help teachers:

- Help students understand the place value of digits (ones, tens, hundreds, and so on).

- Identify how place value helps students with other skills, such as reading and writing numbers.

- Practice a new teaching activity.

Illustration of Teaching

REFLECT:

- What number did the teacher show?

- What mistake did the student make?

- Why do you think they made this mistake?

Ideas to Consider

The teacher used sticks to show 23, and the student wrote 32. There could be different reasons for this mistake. The student might not understand place value to connect the digit to the quantity that it represents. They might correctly identify that there are 2 tens and 3 ones but not understand how to write the digits in the correct place in the number. Or, the student might not know how to use sticks to show tens and ones. The teacher should try to understand why the student made this mistake so that she can support them.

Recommended Materials
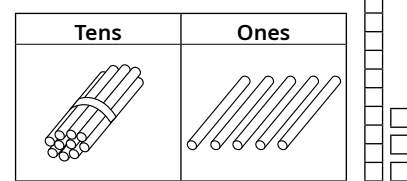
Tens	Ones

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

We use place value to understand numbers and their digits, as well as to read and write numbers. In this mini-module, you will explore ways to support children as they learn about the place value of digits.

## ACTIVITY: READ, WRITE, AND REPRESENT A NUMBER

This activity can be completed alone, in pairs, or with a group of teachers. If you have colleagues to work with, take turns choosing numbers and representing them with place value materials. Discuss your responses to the questions.

Purpose: Practice representing two-digit numbers in different ways that help students understand the place value of their digits.

Materials needed: Place value manipulatives (e.g., sticks with rubber bands or strings to group them) and place value charts with tens and ones.

Instructions

- Write a two-digit number down and read it aloud. For example: 34

- Ask: ***What mistake do you think a child might make when reading this number?***

- Count out the number using place value materials.
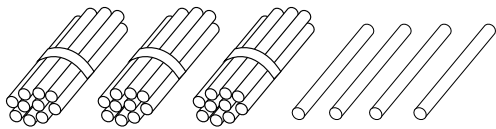
- Write the number in the place value table.

Tens	Ones
3	4

- Ask: ***What is the tens digit?*** (Answer: 3) ***What is its value?*** (Answer: 30)

- Ask: ***What is the ones digit?*** (Answer: 4) ***What is its value?*** (Answer: 4)

- Write the number in expanded form: 34 = 30 + 4

- Ask: ***Can you think of any other ways to represent 34? Why is it helpful to practice representing numbers in different ways?***

What Do Children Learn about the Place Value of Digits?

Children should first build an understanding of place value by practicing with materials such as sticks, as shown in Mini-Module A. This practice helps them understand the meaning of numbers and their digits. After they are comfortable with these materials, they are ready to practice place value in more abstract ways. They may be asked to simply read or write numbers, to write a number in a place value chart, or to write a number in expanded form.

Understanding the place value of digits is very important. It prepares students for many other math skills, such as addition and subtraction of two-digit numbers. They build their understanding of place value during each primary grade level, as they work with larger numbers.

Children should be able to . . .	What does this mean?	Example
Read and write numbers	Identify the relationship between number names and place value. Read numbers aloud and write numbers based on their names.	Read the number 624: "six hundred and twenty-four" Write the number fifty-six: 56
Identify the value of a given digit within a number	Identify how many hundreds, tens, or ones are in a number based on the place value of digits.	What is the value of 3 in 236? 30 How many hundreds are in 236? "2 hundreds"
Skip count by 10 and 100	Use place value to identify number patterns that count by 10 and 100.	Count by 10: "2, 12, 22, 32, 42, …" Count by 100: "20, 120, 220, 320, …"
Write numbers in expanded form	Write a number as an addition sentence based on place value.	23 is composed of 20 and 3: 23 = 20 + 3 351 is composed of 300, 50, and 1: 351 = 300 + 50 + 1

For the Skip count row, a 1–100 hundreds chart is shown:

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

Reflection

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

A teacher says to her students, "Please listen and write this number in your exercise book: three hundred and twenty-four."

- What mistakes do you think students could make?
- Why do you think they could make these mistakes?
- How could you support them in writing 324 correctly?

Teaching Practice

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

ACTIVITY: WRITE NUMBERS IN A PLACE VALUE CHART

Purpose: Develop an understanding of how to write numbers in a place value chart by first representing them with manipulatives.

Materials needed: Place value manipulatives (e.g., sticks with rubber bands or strings to group them) for all students, a place value chart (e.g., on a slate or exercise book) for all students, writing materials (e.g., board and chalk, pens and exercise books).

Note: This activity may be changed based on students' knowledge and available materials. For example, you may use a place value chart with hundreds or use base 10 blocks instead of sticks.

Instructions

• Give a set of sticks and a place value chart to all students.

• Say: *I am going to give you a number. I want you to make that number with your sticks.*

• Write the number on the board: 23

• Students should make 23 using 2 groups of ten and 3 ones.

• Ask: *How many groups of ten are there?* (2 tens) *How many ones?* (3 ones)

• Together with students, count the groups of ten and the ones: *10, 20, 21, 22, 23*

• Say: *Now I want you to write the number 23 in your place value chart.*

• Invite a student to write the number 23 in the place value chart on the board. Have others check their work.

• Say: *2 is in the tens place because we have 2 groups of ten. 3 is in the ones place.*

• Say: *Now write 23 in expanded form. Remember that expanded form is a sum of tens and ones.*

• Give students a moment to write the expanded form.

• Write on the board: 23 = 20 + 3

• Repeat many times with different numbers.

NOVEMBER 2024

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