

K

Topic 11: Decomposing Numbers 11 to 19

Lessons 1-5

Math Intervention Resources

Reteach

MDIS:

A14: 11-2, 11-3, 11-4, 11-5

Guided Practice

Some children may become discouraged if they easily lose track of how many counters they have placed in double ten-frames. For these children, you may wish to create numbered counters. You can do this by placing a number sticker or small square of masking tape (labeled 1 to 19) on each counter. Have children place these numbered counters in the double ten-frames in numeric order. Most children will quickly recognize that 5 counters always complete one row of a ten-frame, 10 counters always complete one full ten-frame, and that 15 counters always complete one full ten-frame and one row of a second ten-frame. Benchmarks such as these will help the child move toward using counters that are not numbered.

Reinforce

Envision Math Games:

Topic Games:

- Take Home the Bears!

envision Online Games

- Math facts practice

Symbaloo

Building Blocks (Golden CD)

10 Block Materials:

- Drill Doughnuts
- Examining the Addition Table

Assessments

K

Topic 11: Decomposing Numbers

11 to 19

Lesson 11-1

MDIS: A14

Creating Sets to 19

Quick and Easy Lesson Overview

Objective	Essential Understanding	Vocabulary	Materials
Children will use objects to create sets to 19.	There is more than one way to show a number.	double ten-frame set	Number Cards 11–19 (Teaching Tools 5, 6), counters (or Teaching Tool 32), glue



Math Background

Children begin to visualize the relationship between ten and the teen numbers by using ten-frames. Using ten-frames helps them visualize that a teen number is 10 and

some more. Children will begin to develop an understanding of place-value and two-digit numbers.

2

Guided Practice

Remind children to look at the counters and ten-frames at the top of the page to help them.

Error Intervention

If children have difficulty drawing the correct number of counters, **then** have them work with counters and a double ten-frame (or Teaching Tool 9).

Do you understand? *How many counters did you draw in the top ten-frame?* [10] *How many counters did you draw in the bottom ten-frame?* [Answers will vary.] *How many counters did you draw in all?* [Answers will vary.]

Reteaching Have children use objects such as crayons or paper clips to first make a set of 10 and then count on or add a number of objects 1 through 9 to the set of 10. Repeat with many different numbers.



Common Core

Domain

Number and Operations in Base Ten

Cluster

Work with numbers 11–19 to gain foundations for place value.

Standard

K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Mathematical Practices

- ✓ Make sense of problems and persevere in solving them.
- ✓ Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- ✓ Model with mathematics.
- ✓ Use appropriate tools strategically.
- ✓ Attend to precision.
- ✓ Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

K

Topic 11: Decomposing Numbers

11 to 19

Lesson 11-2

MDIS: A14

Parts of 11, 12, and 13

Quick and Easy

Lesson Overview

Objective	Essential Understanding	Vocabulary	Materials
Children will represent the decomposition of 11, 12, and 13 as ten ones and additional ones.	The numbers 11, 12, and 13 can be decomposed as the sum of ten and some ones. The number 11 is decomposed to $10 + 1$, the number 12 is decomposed to $10 + 2$, and the number 13 is decomposed to $10 + 3$.		Counters (or Teaching Tool 32)



Math Background

Decomposition of numbers is helpful in developing a child's number sense. The concept will later be applied to the standard algorithms for addition and subtraction. The decomposition of a teen number into the parts of ten and some more is a beginning foundation to later work with larger numbers.

For example, if a child wanted to add $18 + 15$, he or she could simply decompose the numbers into $10 + 8$ and $10 + 5$. If a child can decompose numbers into tens and ones, they can better understand quantitative relationships and flexibly use numbers and operations to solve problems.

2 Guided Practice

Remind children to break apart numbers 11 to 13 into a group of 10 ones, or one ten, and a group of one, two, or three extra ones.

Exercise 1

Error Intervention

If children do not make a group of 10 counters,

then remind them to fill up one ten-frame entirely with 10 counters before moving on to the other ten-frame.

Do you understand? *How can you use ten-frames to help you write 13 as two parts with 10 as one part?* [Count out the number of counters in all. Fill a ten-frame with 10 counters. Then use the extra counters to fill the new ten-frame. The number sentence is $10 +$ the number of counters in the second ten-frame.]

Reteaching Display 12 counters. From those 12 counters, ask children to separate a group of 10 counters. *There are 10 ones in this group. We can call this group one ten. How many more counters are there?* [2] Write $12 = 10 + 2$ on the board. Review with children how the number sentence relates to 12 as a combination of 10 ones and 2 more ones. Repeat the process with 11 and 13.



Common Core

Domain

Number and Operations in Base Ten

Cluster

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Mathematical Practices

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
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K

Topic 11: Decomposing Numbers

11 to 19

Lesson 11-3

MDIS: A14

Parts of 14, 15, and 16

Quick and Easy Lesson Overview

Objective	Essential Understanding	Vocabulary	Materials
Children will represent the decomposition of 14, 15, and 16 as one ten and four, five, or six ones.	Teen numbers can be decomposed as the sum of ten and some ones. The number 14 is decomposed to $10 + 4$, the number 15 is decomposed to $10 + 5$, and the number 16 is decomposed to $10 + 6$.		Counters (or Teaching Tool 32)



Math Background

When children write equations, they are forming an abstract sentence that can apply to a limitless number of situations. For children to use this mathematical power, they must be able to take situations and problems from their world and connect them to symbols and numbers in mathematical terms. That process is called *mathematizing*. To *mathematize* situations, young children must have many experiences and guidance, learn to write formal mathematical notation (e.g., = and +), and use these symbols to describe a drawing that represents the situation (NRC, 2009).

Please note that in this lesson, children begin by contextualizing the children on train cars that only hold 10, they then progress to using faces as they might appear on a bus, then they use more abstract counters, and finally they use numerals and symbols to describe how many. They then are required to decontextualize the situation by responding to questions about the meaning of each of the symbols involved. To reason abstractly and quantitatively, young children must develop both the ability to decontextualize and contextualize.

2 Guided Practice

Remind children each counter shows 1 in the ten-frame. When they count the counters in the ten-frame, it should match the number they are working with.

Error Intervention

If children place the counters randomly in the second ten-frame, **then** show them that even though their answer shows the same number of counters, it is hard to quickly count them if they are not in order. Suggest they start along the top line of the second ten-frame.

Do you understand? Have students describe how to break 14, 15, or 16 into parts, with 10 as one part. [Count out the number of counters. Completely fill up a ten-frame and then use the extra counters to begin a new one.]

Reteaching On the board, write 14, 15, or 16. Model writing the appropriate number sentence by first creating two ten-frames.



Common Core

Domain

Number and Operations in Base Ten

Cluster

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Mathematical Practices

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K

Topic 11: Decomposing Numbers

11 to 19

Lesson 11-4

MDIS: A14

Parts of 17, 18, and 19

Quick and Easy

Lesson Overview

Objective	Essential Understanding	Vocabulary	Materials
Children will make drawings and write number sentences that represent the decomposition of 17, 18, and 19 into ten and 7, 8, or 9 ones.	Number sentences can be written to represent the decomposition of 17, 18, and 19 as the sum of 10 and 7, 8, or 9 additional ones.		Two-color counters (or Teaching Tool 32), connecting cubes, crayons



Math Background

The double ten-frame is an especially important tool to think about numbers as large as 17, 18, and 19. In this particular lesson, children start out with a long train of connecting cubes that by their very nature are difficult to count visually. However, the task becomes very easy when the cubes are broken apart and placed in the ten-frames.

Then, because children have used the ten-frames consistently and often, they can immediately see the number as a ten and some ones. With experience, the double ten-frame model is a very appropriate tool for a beginning understanding of place value and the parts of teen numbers.

2

Guided Practice

Remind children to use the ten-frames to help them decompose 17, 18, and 19 into one ten, or ten ones, and seven, eight, or nine additional ones.

Error Intervention

If children have difficulty drawing the correct number of squares, **then** have them work with counters and a double ten-frame (Teaching Tool 9). Remind them to fill the first ten-frame to make one ten and put the remaining ones in the second ten-frame.

Do you understand? *How can you break apart a teen number into one ten and some more ones, make a drawing, and write a number sentence to describe it?* [Make two parts and include one part that is ten. Draw 10 counters in one ten-frame and more ones in the other ten-frame. Write a number sentence in the form $__ = 10 + __$.]

Reteaching Give pairs of children a double ten-frame and 18 two-color counters. Have children put 10 red counters in the first ten-frame. Then have them put 8 yellow counters in the second ten-frame. *How many counters are there in all?* [18] *How many red counters are there?* [10] *How many yellow counters are there?* [8] Write $18 = 10 + 8$ on the board.



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Topic 11: Decomposing Numbers

11 to 19

Lesson 11-5

MDIS: A14

Problem Solving: Look for a Pattern

Quick and Easy

Lesson Overview

Objective	Essential Understanding	Vocabulary	Materials
Children will identify patterns found in decomposing the teen numbers, including the constant of one ten and the variable number of ones. They will make drawings and write number sentences for numbers 11 to 19.	Some problems can be solved by identifying elements that repeat in a predictable way.		Counters, crayons, large piece of paper, such as butcher paper



Math Background

Recognizing patterns and organizing information are part of recognizing structure. To become mathematically proficient, children must learn to identify number patterns. In this place value activity, there are repeating patterns that can be demonstrated by looking

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19

at the groupings made in the tens and ones. The repeating pattern demonstrated in the following grouping is foundational to an understanding of the base-ten system and thus an important mathematical practice for young children.

2

Guided Practice

Remind children to use counters to help them solve the problems.

Error Intervention

If children have difficulty writing the correct numbers,

then have them use a red crayon to write the number 10 and a yellow crayon to write the number of additional ones. Help them see how the numbers in the number sentence relate to the counters.

Do you understand? *How can you describe the pattern used to break apart 19?* [Completely fill up one ten-frame. Then use the leftover counters in the second ten-frame. Write 10 for the full ten-frame. Write the leftover counters as ones.]

Reteaching On the board, write 16. Model breaking apart the number into one ten and ones using ten-frames and counters.



Common Core

Domain

Number and Operations in Base Ten

Cluster

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