EXPLORATIONS™

Unit 2

Food for Thought

Concepts

- Counting to 100 (concept of order)
- Connecting number words and numerals
- Part-whole relationships
- Place value notation
- Place value (interpreting 2-digit numbers)
- Problem solving

Materials

- TI-10
- Book: *The Cheerios Counting Book*
- Cheerios® or similar cereal
- 2-ounce (about 50 ml) condiment cups (available in school cafeterias or restaurant supply stores)
- Number Name activity sheets (10-19, 10-100)
- Blank Number Name activity sheet

Calculator Connections

- Scrolling
- 2-line display
- Basic operations + −
- Problem solving
- Place value

Suggested Age/Grade Level

- Ages 6-8
- First through second grades

Overview

After listening to *The Cheerios Counting Book* written by Barbara Barbieri McGrath and illustrated by Rob Bolster and Frank Mazzola, Jr. (Scholastic, Inc., 1998) students are given the opportunity to build the numbers from ten through one hundred with cereal. Students explore the same numbers with the TI-10 Place Value feature. The sequence of this lesson provides transition from the notion of grouping objects into various groups to working with base ten.

Assessment

Assessment should be done through student work samples and teacher observation. The following items should be considered.

Student activity sheets and teacher observations can be used throughout the unit.

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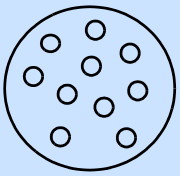
New Vocabulary:
Digit
Grouping
Groups
Ones
Place value
Tens

Prerequisite Skills:
Counting to ten
Concepts from Unit 1

Example:



Activity A: Connecting Literature and Mathematics

Show the cover of *The Cheerios Counting Book* to students. Ask them to make predictions about the other numbers that might be in the book.

Questions to ask:

- What numbers do you think that the author may have in this book?
- How might they be arranged?
- How might they be counted?

Activity B: Building Numbers from 10-20

1. Pass out one hundred Cheerios® and ten condiment cups to pairs or small groups of students.

Instruct students to use the cups to help them organize (group) the Cheerios to count to 20.

Questions to ask:

- How did you and your partner count?
- How did you decide the number of Cheerios to place in each cup?
- What are some other ways of counting to twenty?
- How would you describe where you have seen these ways used before?
- Suppose you count by tens. How could you show the number ten with your Cheerios and cups? (one cup of ten)
- How would you show this with a picture?

2. Read *The Cheerios Counting Book* and stop at the page with the numbers eleven through nineteen.

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Explain that the illustrator did not make pictures for the numbers 11-19.

Question to ask:

- How could you show the number eleven with your Cheerios® and cups?

Count by saying ten, while touching the cup. Say eleven, while touching the single Cheerio.

Question to ask:

- How would you show the number eleven with your Cheerios and cups?

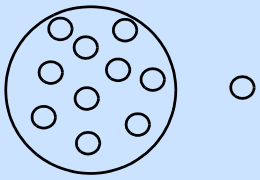
3. Pass out the Number Name Activity Sheet for the numbers ten through nineteen.

Instruct students to use their Cheerios and cups to make, say, and draw a picture of each number. Tell students that each time they make the number, they will also enter it on the TI-10.

Teaching Tip:
Model counting by tens while picking up each cup.

Example:

Example:



Activity C: Building Numbers with the TI-10

Tell students to place the TI-10 next to their activity sheet.

1. Press ON to begin.
2. Press AC to clear anything previously stored in the memory.
3. Press Clear. The screen is blank (except for the cursor), the memory is clear, and you are ready to get started.

Place a transparent condiment cup filled with ten Cheerios® on the overhead projector. Explain again that this cup stands for ten.

4. Press 1 0 Enter.

Place one more Cheerio on the overhead projector and explain that the number represented is now eleven.

5. Press + 1 Enter.

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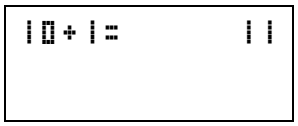
The TI-10 displays:



Add one more Cheerio® on the overhead projector to represent twelve.

6. Press + 1 Enter.

The TI-10 displays:

Instruct students to continue to make, say, and draw the numbers from ten through nineteen and enter them on the TI-10.

When finished, ask students to select one of the numbers that they have made with their cups and Cheerios. The number fifteen will be used in this example.

Questions to ask:

- How many Cheerios did you use to make the number fifteen?
- How did you show fifteen?
- Why are some Cheerios inside the cup and some outside the cup?
- How might the TI-10 show us the number of cups to use?
- How might the TI-10 show the number of Cheerios in the cup and outside the cup?

Tell students to place the TI-10 next to their Cheerios and cups.

7. Reset the TI-10.
8. Press the problem solving key ◈.
9. Press the Auto toggle key to immediately choose manual problem solving.
10. Press 1 5 because this is the number you will use.

Teaching Tip:'
Remind students that they can use the scrolling keys ◁▷ ◁▷ to see all of the number sentences they create.

Resetting the TI-10:
Press On/Off to wake it up if it has turned off.

Press AC if you need to clear the memory.

Press Clear to clear the display.

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11. Press [■/1.] so that the TI-10 will show how many Cheerios® and cups make numbers.
12. Press [1.] to show how many Cheerios will make the number 15.

The TI-10 displays:

This means that if you counted by ones to 15, you would have 15 Cheerios.

Question to ask:

- You have been grouping your Cheerios by tens in the cups. How did you show fifteen with your Cheerios and cups?

13. Press [10.] to find out how many cups of ten Cheerios you will need to make the number fifteen.

The TI-10 displays:

14. Press [5] to show how many Cheerios are outside of the cup.

The TI-10 displays:

Question to ask:

- What is the value of the place that the five is holding?

This means that when you use groups of ten (cups) and ones (Cheerios) to make the number fifteen, you used 1 group (cup) of 10 and 5 ones (Cheerios).

Instruct students to select other numbers from ten through twenty. Repeat the steps above with the new numbers.

Teaching Tip:
With this feature, the default display will show the total number of ones in the number fifteen before any grouping. It is an important concept for students to understand that grouping does not change the size of the number. Grouping serves as an organizational way of identifying the size of the number.

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Examples:
1 ten and 5 ones

OR

1 ten and 5 ones
= 10 + 5 = 15

Provide students the opportunity to explore with the numbers ten through nineteen and the Place Value feature to increase understanding of the tens and ones (cups and Cheerios®) that make up these numbers.

Encourage students to record the number name with the place value notation on paper.

Activity D: Building Numbers to 100 with Tens

1. Revisit *The Cheerios Counting Book*. Ask students to make more predictions about how the author may have grouped the Cheerios® in the rest of the book.

Questions to ask:

- How might the author group the Cheerios in the rest of the book?
- How many Cheerios do you think that the author used?

2. Read the pages about the numbers 10-100.

Questions to ask:

- How were your predictions like the author's groupings?
- Why do you think that the author used groups of ten?
- How would you show the number thirty with your Cheerios and cups?
- How might you count to thirty using Cheerios and cups?

Encourage students to count by touching the cups and saying ten, twenty, thirty, and so forth.

3. Pass out the Number Name Activity Sheet for Numbers 10-100 which is located at the end of this unit. Tell students that they will be using their Cheerios and cups to make, say, and draw a picture of each number.

Tell students that each time they make the number, they will also enter it on the TI-10.

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Activity E: Building Numbers to 100 with tens and the TI-10

Ask students to place their TI-10 next to their activity sheet (10-100).

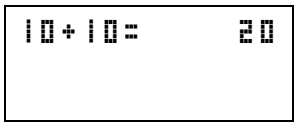
Each time the student makes, says, and draws the number; the student will also make that number on the TI-10.

1. Reset the TI-10.
2. Place a transparent condiment cup with ten Cheerios® on the overhead projector and say let's start with ten.
3. Press [1] [0] [Enter].

The teacher adds 1 more condiment cup with 10 Cheerios on the overhead projector and says twenty.

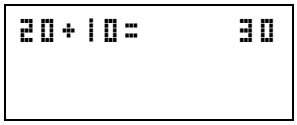
4. Press [+] [1] [0] [Enter].

The TI-10 displays:



5. Press [+] [1] [0] [Enter].

The TI-10 displays:



Ask students to continue to make, say, draw, and record each number on the TI-10 and activity sheet for 10-100.

Students can press ◁▷ to see all of the number sentences entered into the TI-10.

Ask students to select one of the numbers that they have made with their cups and Cheerios. Use the number 30 as an example.

Questions to ask:

- How many Cheerios did you use to make the number thirty?

Resetting the TI-10:
Press (On/Off) to wake it up if it has turned off.

Press (AC) if you need to clear the memory.

Press (Clear) to clear the display.

Example:
Continue to add additional condiment cups with ten Cheerios® on the overhead projector one at a time. Have students add ten on the TI-10 each time you add a new cup.

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Resetting the TI-10:
Press (On/Off) to wake it up if it has turned off.

Press (AC) if you need to clear the memory.

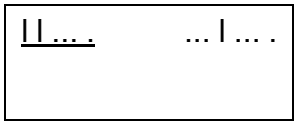
Press (Clear) to clear the display.

- How did you show thirty?
- Why are there no Cheerios® outside of the cup?
- How can the TI-10 show us the number of cups to use?

Ask students to place their TI-10 next to their cups and Cheerios.

6. Reset the TI-10.
7. Press ◈.
8. Press the (Auto) toggle key to immediately choose manual problem solving.
9. Press (Mode).
10. Press ◁▷ to show two choices for working with place value.

The TI-10 displays:



11. Press ◁▷ to underline ... I ... .

The TI-10 displays:

12. Press [Enter].
13. Press (Mode) to exit the choice screen and return to the work screen.
14. Press [3] [0] because this is the number that we will use.
15. Press [■].
16. Press [10.] to find out what digit is in the tens place.

The TI-10 displays:

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Question to ask:

- What might you say about this digit?

17. Press [1.] to find out what digit is in the ones place.

The TI-10 displays:

Question to ask:

- What might you say about this digit?

18. Press [0].

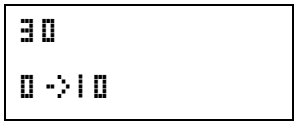
The TI-10 displays:

Question to ask:

- What is the value of that place?

19. Press [3].

The TI-10 displays:



Question to ask:

- What is the value of that place?

This means that when you used Cheerios® to make the number thirty, you used three groups (cups) of 10 and 0 ones (Cheerios).

Provide students the opportunity to explore with the numbers 10, 20, 30, up to 100 and the Place Value feature to increase understanding of the tens and ones (cups and Cheerios) that make up these numbers.

Encourage students to record the number name with place value language.

Sample:
An example of place value language follows.

3 tens and 0 ones

30 + 0 = 30

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Activity F: Building 2-digit Numbers with the TI-10

Tell students that they will explore 2-digit numbers from 20-100 that the author did not include in *The Cheerios Counting Book*.

1. Pass out the Blank Number Name Activity Sheet located at the end of the unit.

Tell students that you will say a number for them to make with their Cheerios® and cups.

2. Say a number aloud to the class. In this example, the number 34 is used.

Questions to ask:

- What number did you hear?
- How might you show that number with your Cheerios and cups?
- How might you draw that number in the first box of your activity sheet?
- How might the TI-10 help show this number?

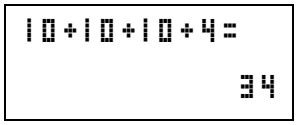
Ask students to place their TI-10 next to the activity sheet.

3. Reset the TI-10.

Ask students to touch their Cheerios and cups as they enter numbers on the TI-10.

4. Press [1] [0] [+] [1] [0] [+] [1] [0] [+] [4] [=].

The TI-10 displays:



Tell students to write that number above their drawing in the first box.

Continue to call out numbers that are appropriate for the age, experience, and understanding of the students until all boxes are filled.

Ask students to enter each of the numbers into the TI-10.

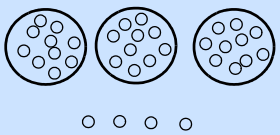
Resetting the TI-10:
Press (On/Off) to wake it up if it has turned off.

Press (AC) if you need to clear the memory.

Press (Clear) to clear the display.

Example:

34



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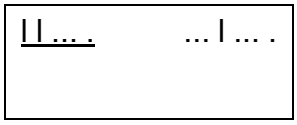
Tell students to follow the steps to enter the Place Value Digit Feature.

Question to ask:

- How many groups of ten are in the number 34?

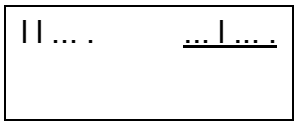
5. Reset the TI-10.
6. Press ◈.
7. Press the (Auto) toggle key to immediately choose manual problem solving.
8. Press (Mode).
9. Press ◈ to show two choices for working with place value.

The TI-10 displays:



10. Press ◈ to underline ... I ... .

The TI-10 displays:



11. Press [Enter].
12. Press (Mode) to exit the choice screen and return to the work screen.
13. Press [3] [4] because this is the number that we will use as an example.
14. Press [■].
15. Press [10.] to find out what digit is in the tens place.

The TI-10 displays:

Question to ask:

- What might you say about this digit?

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16. Press [1.] to find out what digit is in the ones place.

The TI-10 displays:

Question to ask:

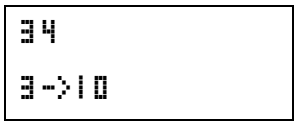
- What might you say about this digit?

17. Press [4] to find the place value of that digit.

The TI-10 displays:

18. Press [3] to find the place value of that digit.

The TI-10 displays:



This means that when you use Cheerios® and cups to make the number 34, you used 3 groups of ten and 4 ones.

Provide students the opportunity to explore the other numbers that were called out with the TI-10 and the Place Value feature to increase understanding of the tens and ones that make up the numbers.

Encourage students to record the number name with place value language on paper.

Extension

Provide students with additional Blank Number Name activity sheets and encourage them to make, draw, and enter additional numbers on the TI-10.

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Number Name Activity Sheet (10-19)

fourteen **14**	nineteen **19**
thirteen **13**	eighteen **18**
twelve **12**	seventeen **17**
eleven **11**	sixteen **16**
ten **10**	fifteen **15**

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Number Name Activity Sheet (10-100)

sixty **60**	ten **10**
seventy **70**	twenty **20**
eighty **80**	thirty **30**
ninety **90**	forty **40**
one hundred **100**	fifty **50**

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Blank Number Name Activity Sheet

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