



Overview

Students will use place-value materials and the calculator to make connections between base-ten numerals and the quantities they represent.

Grade Levels: 1–2




Concepts

- Patterns
- Ordering numbers
- Whole Numbers
- Place Value
- Comparing Numbers
- Addition



Materials

-  TI-10 calculators
Note: the TI-15 Explorer™ calculator can be used in place of the TI-10 for this activity.
- Place-value materials
- Student activity sheet
- Pencils



Assessment

Throughout the activity, questions are included for formative assessment. Student work should be used as a check for understanding. Have the students use the chart and counters along with the TI-10 to complete the activity.



Introduction

If students completed the *Patterns in Counting* activity you may choose to have them refer to it as they complete this activity.

1. Have students make ones blocks, tens blocks, and hundreds blocks out of grid paper for this activity or have them use the paper place-value materials provided in this activity, or commercially made place-value pieces. Have students compare the place-value pieces to convince themselves that a tens block is made up of ten ones blocks (or cubes), and so on.
2. Help students recall how the calculator can be used for counting. (Refer to *Patterns in Counting*.)
3. Have students clear the constant stored in **Op1** by pressing **Mode** **2nd** **2nd** **Enter** **Mode**. Then, have students prepare their calculators to count by tens. Tell them to enter **Op1** **+** **10** **Op1** **0**.
4. Display a tens block. Have students press **Op1** on their calculators and read the display, **10**. As you display the next ten block, have students press **Op1** and read **20**.
5. Display a ones piece and have students discuss how to prepare the calculator to count by ones.

Note: Lead students to realize that they must enter **+** **1** as a constant to count the ones. Press **Mode** **2nd** **2nd** **Enter** **Mode** to clear the constant stored in **Op1**.

Enter **Op1** **+** **1** **Op1** to prepare the calculator to add the ones to the two tens on the calculator.

6. Have students press **Op1** and read the display to continue counting **21**, **22**, **23**, ... as you display each ones piece.
7. Have students discuss what they see in your display compared to what they see on their calculator displays.
8. Have students work in pairs. As one partner puts some place-value pieces in the "Base Ten Pieces" space on the activity sheet, the other partner enters the appropriate commands in the calculator to count the pieces.
9. Have students draw pictures of the base ten pieces they chose. Or have them make a picture using the base ten pieces provided in the Teacher Notes. Ask students to describe how they used the calculator.



Collecting and Organizing Data

While students explore with the place-value materials and their calculators, ask questions like the following.

Questions for Students:

- ❖ *How much is this piece worth? How do you know?*
- ❖ *What patterns do you notice when you are counting the tens?*
- ❖ *What do the numbers you are reading on the calculator represent?*
- ❖ *Do you always have to do the tens first? What would happen if you did the ones first?*



Using the Calculator

- *Why do you enter $\boxed{+}$ 10 as a constant to begin counting the tens?*
- *Why do you change to $\boxed{+}$ 1 when you are counting the ones?*
- *What is happening when you press $\boxed{Op1}$?*

Analyzing Data and Drawing Conclusions

After students have counted several different groups of place-value materials, have them work as a whole group to analyze their observations. Ask questions like the following:

Questions for Students:

- ❖ *What patterns do you notice in the numbers while you were counting?*
- ❖ *How are the tens and ones pieces you chose and the numbers on the calculator connected?*



Using the Calculator

- *How did you use the calculator to represent the total?*
- *How could you use the calculator to count hundreds?
Thousands?*

Continuing the Investigation

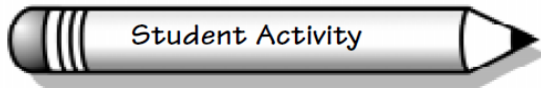
Have students investigate the following questions:

Questions for Students:

- ❖ *How many tens does it take to reach one hundred? Use place-value materials and the calculator to display some numbers that include hundreds.*
- ❖ *Do you always have to count the largest pieces first? What would happen if you counted the ones, then the tens, and then the hundreds? Try it. Record what the calculator displays and compare it to counting the hundreds first, then the tens, and then the ones.*



SOLUTIONS



Name _____

Date _____



Focus: Count hundreds, tens, and ones.

It's the Place that Counts

Collecting and Organizing Data

Base Ten Pieces	Base Ten Pieces

Number: _____

Number: _____

How I used the calculator:

Answers will vary. Possible answer: to count by tens.

Questions we thought of while we were doing this activity:

Answers will vary. Possible answer: What other numbers can we use the base ten pieces to count by? What multiplication can be used to show how we counted?



It's the Place that Counts

Ones blocks

Tens blocks

Hundred block

Tens blocks