



Overview

Students will investigate a pattern using the constant function on the calculator, record the results displayed on the calculator, and describe how the constant key works.

Grade Levels: 3–5




Concepts

- Whole numbers
- Addition
- Comparing numbers
- Multiplication
- Estimation
- Functions



Materials

-  TI-10 or TI-15 Explorer™ calculators
- 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 TI-10 or the TI-15 Explorer™ calculator to complete the activity.



**Introduction**

If students have completed the *Mysterious Constant* activity you may choose to have them recall how they used the constant function on their calculators.

1. Display a copy of the activity sheet. Model the activity on the sheet. Have students choose a constant function and number. Write them in the box at the top left. Then have students enter the constant in their calculators.

Example:

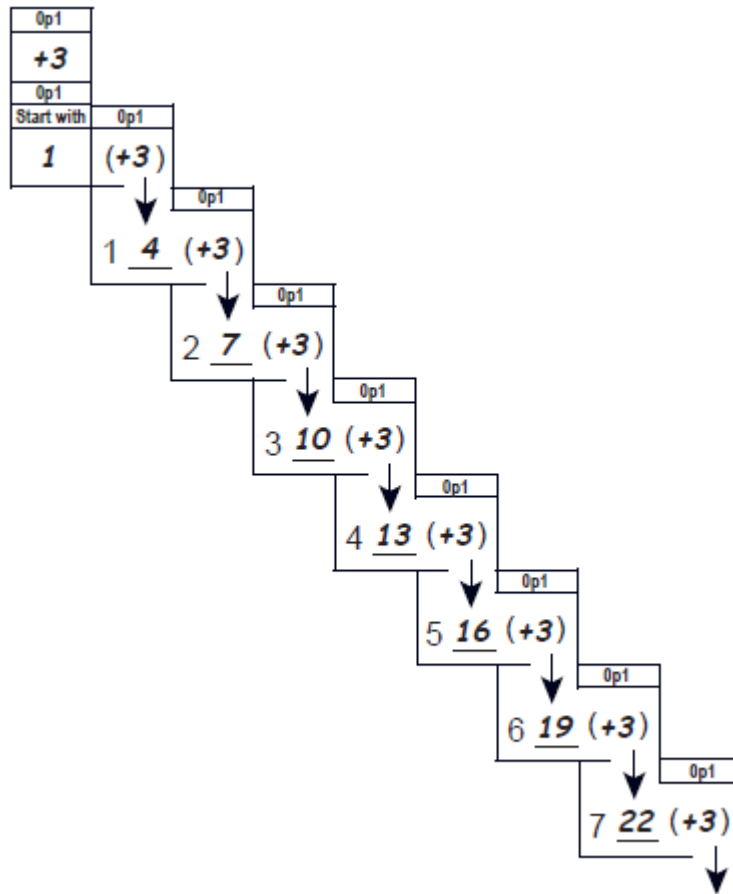
For the constant **+3**, have students enter   **+** **3**   **1**  to prepare their calculators.

2. Ask students to choose the starting number for the pattern, 1, for example. Record it in the “Start with” box below the constant function. Then have students enter the starting number in their calculators.
3. Next have students use their experiences with *The Mysterious Constant* to predict what will happen each time they press .
4. Test their conjectures. Choose a student to write both the constant function (constant operation and constant number) and the result (number on the right of the calculator display) on the displayed activity sheet each time the rest of the students press .

Note: The counter (the number on the left of the calculator display) is already on the activity sheet.



Example:



5. After they have pressed **Op1** seven times, have students describe what is happening each time, as well as any other patterns they notice.
6. Have students predict the next several numbers in the pattern and then verify their predictions with the calculator.
7. Have students work in pairs to choose a different constant function and starting number. Have one partner operate the calculator. Each time he or she presses **Op1**, have the other partner record the constant function and the result that appears in the calculator display.
8. After exploring several different constant functions and starting numbers, have students explain how **Op1** works and describe a real-life situation in which the constant function might be helpful.



Collecting and Organizing Data


While students explore their patterns, ask questions such as:

Questions for Students:

- ❖ *What do the numbers on the left of your display represent? How about the numbers on the right of your display?*
- ❖ *Are the numbers on your activity sheet getting larger or smaller? By how much?*
- ❖ *What patterns do you notice?*
- ❖ *What would happen if the constant function remained the same but the starting number changed? How would the numbers on your recording sheet change?*





Using the Calculator

- *How could you describe what the calculator does each time you press ? Following that pattern, what number should come next?*
- *How can you use the calculator to predict the 95th number in your pattern?*

**Analyzing Data and Drawing Conclusions**

After students have investigated several different constant functions and beginning numbers, have them work as a whole group to analyze the patterns. Ask questions such as:


Questions for Students:

- ❖ *What are some strategies you used to predict how pressing  would affect your display?*
- ❖ *Describe the patterns you discovered.*
- ❖ *What happened when you kept the same constant function but started with different numbers?*
- ❖ *What did you notice when you kept the same beginning number but entered a different constant function?*
- ❖ *What did you write to explain how the constant key works?*
- ❖ *How could you use mathematical symbols to describe how  works?*
- ❖ *When might the constant function be useful?*

**Using the Calculator**

- *How did you use your calculator to help you make predictions?*

Continuing the Investigation

Have students invent a constant function that involves more than one operation. Ask: *Can you predict the pattern that would develop if you entered your beginning number and kept pressing ? How could you check your prediction?*



SOLUTIONS



Name _____

Date _____

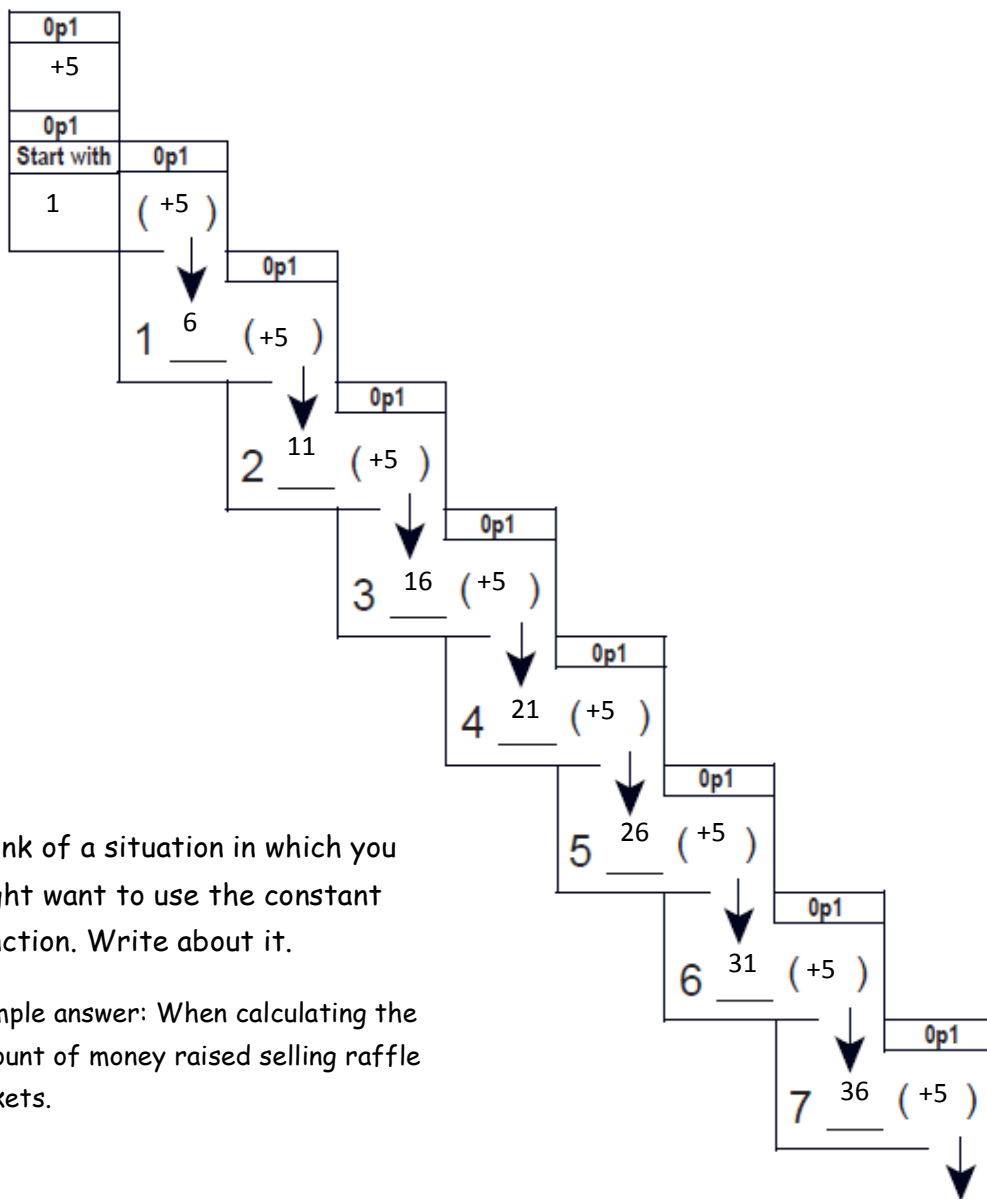


Focus: Use the constant function to create a pattern.

CONSTANT-ly

Collecting and Organizing Data

How **Op1** works: **Sample answers:**



Think of a situation in which you might want to use the constant function. Write about it.

Sample answer: When calculating the amount of money raised selling raffle tickets.