

# 100 or Bust

## Math Concepts

- whole numbers
- estimation
- place value
- addition
- comparing numbers
- subtraction

## Materials

- TI-10, TI-15 Explorer™
- place-value materials
- **100 or Bust** recording sheets
- pencils
- number cubes (or dice)

## Overview

Students will use estimation, place-value materials, and the calculator. They will place each of seven randomly generated digits on a place-value chart in either the ones or tens column to make a sum as close to 100 as possible without going over 100.

## Introduction

1. Set up the activity by telling students: Seven people have a total of exactly \$100. Each person has either all \$1 bills or all \$10 bills. How much money could each person have?

**Note:** There are several possible answers.

2. Have students work in groups of three. While playing the game, the group will roll the number cube seven times. The result of each roll will represent either how many \$1 bills or \$10 bills someone in the group of seven people has.
3. On the overhead projector, model the game several times by rolling the number cube, demonstrating the three procedures/responsibilities, and explaining the rules.

## Procedures/Responsibilities

- 1) The first student rolls the number cube. Based on the whole group's decision, he or she then records each of the resulting digits in the proper column on the place-value chart on the recording sheet.
- 2) The second student uses place-value materials to represent the amounts on the hundred grid as they are written on the chart.
- 3) The third student uses the calculator to keep a total by adding the amount of each roll of the number cube.

## Rules

- Roll exactly seven times.
- Place (write) each digit rolled in either the ones or tens place (column) to make a sum  $\leq 100$ .

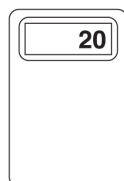
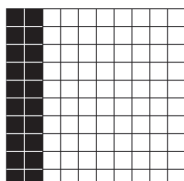
# 100 or Bust *(continued)*

## Introduction (continued)

### Example:

The first student rolls a 2. The group decides to put the 2 in the “Tens” column. The first student writes 2 in the “Tens” column and 0 in the “Ones” column. The second student uses place-value materials to represent 20 on the hundred chart. The third student enters 20 in the calculator.

Tens	Ones
2	0



- Have students play the game at least three times, rotating the responsibilities each time, so that each student gets to work with each representation. Each time they play, students should look for strategies to play a better game.

## Collecting and Organizing Data





While students play the game, ask questions such as:

- How did you decide to place this digit in the ones place? The tens place?
- How does your sum affect your strategy as you play?
- What if we changed the rules so that you could go over 100, or so that you could choose to either add or subtract the number that comes up on the number cube? Could you get closer to 100?

## Analyzing Data and Drawing Conclusions

After students have played three games and recorded their data, have them work as a group to analyze the games. Ask questions such as:

- How did your strategies change within a game? How did your strategies change as you played more games?

-  What does the recording sheet keep track of for you that the calculator doesn't?
-  What do the place-value materials show that the calculator and recording sheet don't?
-  What does the calculator help you do?
-  How did you use the calculator to help you decide what to do next in the game?

# 100 or Bust (*continued*)

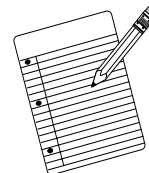
## Analyzing Data and Drawing Conclusions (*continued*)

- What if you did not have to roll exactly seven times? What if you could roll fewer times? What if you could roll more than seven times? How would your strategies change?
- Is there any game that you played that could have made a sum of 100 if you rearranged the digits? Use your recording sheet and calculator to find out.

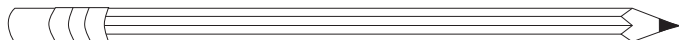
## Continuing the Investigation

Have students:

- Play the game with polyhedral dice other than cubes and see whether their strategies need to change.
- Find a set of seven rolls that would equal exactly 100.
- Investigate how many sets of seven rolls they can find.
- Revise the game to include the 100s place and try to make a sum of 1000.



Name:



# 100 or Bust Recording Sheet

## Collecting and Organizing Data

Game 1	
Tens	Ones

Game 2	
Tens	Ones

Game 3	
Tens	Ones

## Hundred Grid


Strategies we used while we were doing this activity: