

## NUMBER CONCEPTS SESSION

Activity: Make a Hundred

Objective: Use the concept of place value to make decisions in a game.

Materials: Calculators  
Base ten materials  
One die  
One game board  
One recording sheet per two or three students  
Overhead base ten materials  
Transparency of game board and recording sheet  
Overhead calculator for trainer if available

Procedures:

1. If you rolled a die exactly 7 times, what is the largest sum you could make? (Could you make 100?) What if each number represented that many 10's?
2. Explain the game: Players must roll exactly 7 times and place each digit rolled in either the ones or the tens place to make the sum  $< 100$ , trying to get as close to 100 as possible. (If you had \$100 and could buy exactly 7 items, what would you buy?)
3. Model the game on the overhead as a student rolls two or three times:
  - Write the number in the ones or tens on the record sheet (wherever the class decides).
  - Show the amount by laying the base-ten blocks on the game board flat.
  - Record the addend on the calculator. (After the first roll, add the addend and show the sum on the calculator.)
4. Have students play the game at least three times, looking for strategies to play better each time.
5. Questions to ask:
  - How did you decide to place this digit in the ones place? The tens place?
  - What does the record sheet keep track of for you that the calculator doesn't?
  - What do the base ten blocks show that the calculator and record sheet don't?
  - What does the calculator help you see?
  - How does your sum affect your strategy as you play?

6. In summary ask:
- What strategies did you use?
  - How does luck affect the game? What can we use to help us deal with luck in a game?
  - How did your strategies change as you played more games? How did your strategies change within a game?
  - What if you did not have to roll exactly 7 times? What if it could be fewer? What if you could roll more than 7 times?
  - How did you use the (calculator, record sheet, base ten model) to help you decide what to do next in the game?
  - Is there any game that you played that could have made a sum of 100 if you rearranged the digits? Use your record sheet and calculator to find out.

Extensions:

1. Play the game with polyhedral dice other than cubes and see if strategy should change.
- 2. Make up a set of 7 rolls that would equal exactly 100. How many can you find?
3. Revise the game to include the hundreds place and try to make a sum of 1000.

Notes:

Resource: *Family Math* by Jean Kerr Stenmark

Assessment

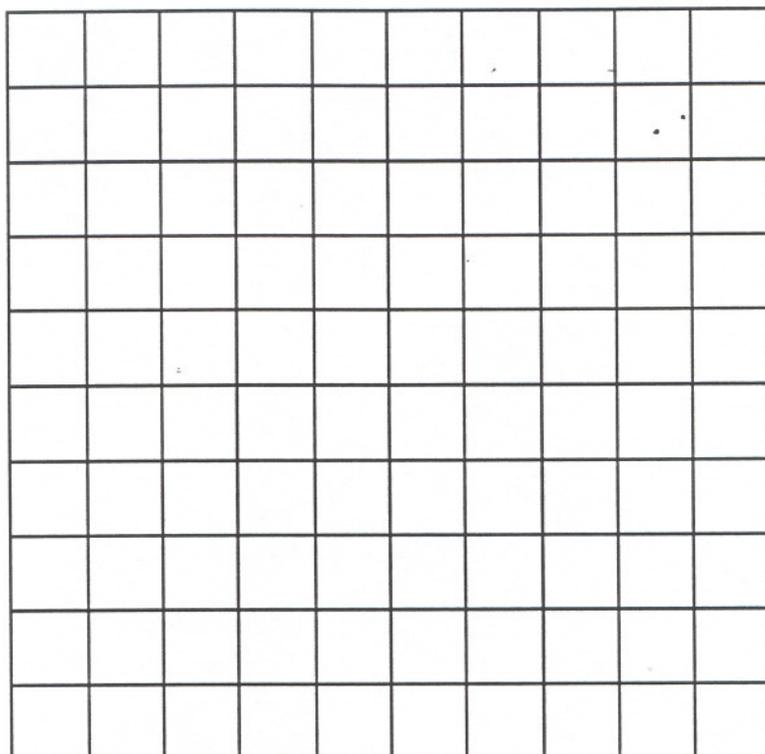
1. Questions:
  - How would you change your strategy for the next game you played? Why? Play two more games to test your strategy. What refinements would you make based on this new information?
  - Present a hypothetical game--show sum on calculator, record sheet, and base ten model. Ask students to analyze the game. Do they agree or disagree with the way it was played, what to do next, etc.?
  - See summary questions.
2. Observations:
  - Were students using base ten materials appropriately?
  - Were the students recognizing the connections between the three methods of recording?
  - Were they using mathematical concepts to design strategies (e.g., probabilities of getting certain outcomes when rolling dice, using subtraction to determine how much is left)?

3. Tasks:

- Find the game you played that would have gotten you closest to 100 if you had placed the numbers differently.
- Write a summary statement of what you learned from the game.
- Graph scores from first game, second game, and third game to see if strategies improved the range of scores. (Were scores on third game closer to 100 than those on first game?)

# Make a Hundred

Game board



**' RECORD SHEET  
for  
MAKE A HUNDRED**

Game 1

Tens	Ones

Game 2

Tens	Ones

Game 3

Tens	Ones

Game 4

Tens	Ones