

CLOSEST TO 100

NUMBER

- Estimation
- Counting
- Addition
- Place value

Getting Ready

What You'll Need

Snap Cubes, 20 per team

Snap Cube sticks—each made up of 10 Snap Cubes of the same color, 10 per team

Closest to 100 game board, 1 per team, page 91

Die, 1 per group of teams

Snap Cube grid paper (optional), page 93

Overhead Snap Cubes and/or Snap Cube grid paper transparency (optional)

Overview

In this game for two to four teams of two players each, children choose single Snap Cubes or sticks of ten Snap Cubes according to the roll of a die. They position the cubes on a 100-grid in an effort to be the ones to come closest to covering the grid. In this activity, children have the opportunity to:

- ◆ work with place-value concepts
- ◆ estimate
- ◆ find two-digit sums



The Activity

You may wish to have children assemble the sticks of 10 Snap Cubes themselves prior to playing the game.

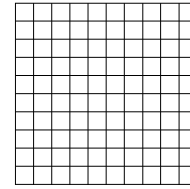
Introducing

- ◆ Show children a pile of single Snap Cubes and several sticks of 10 Snap Cubes. Have children count the cubes that make up a stick along with you to verify that there are ten.
- ◆ Display a sheet of Snap Cube grid paper. Call on a volunteer to roll a die and to announce the number that comes up. Have another volunteer place that many of the single cubes anywhere on the grid so that each cube lies within a grid square.
- ◆ Have other volunteers roll the die and place Snap Cubes on the grid until more than 10 cubes have been placed.
- ◆ Then tell children that you would like to trade some of the cubes on the grid for one of the Snap Cube sticks. Call on a volunteer to do this, then explain why the trade was fair.
- ◆ Play part of a game of *Closest to 100* with children before they begin *On Their Own*.

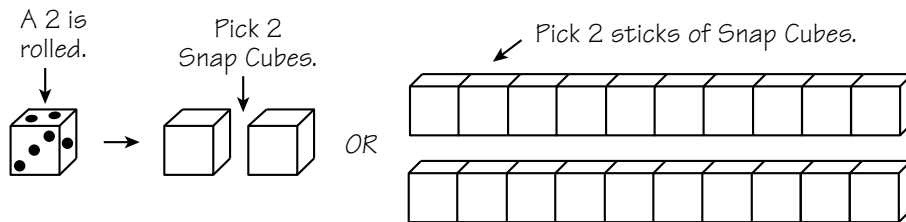
On Their Own

Play *Closest to 100!*

Here are the rules.



1. This is a game for a team of 2 players. Two or more teams play together. The object is to use Snap Cubes to cover as many squares as possible without going over 100 on a game board that looks like this:
2. Each team gets a game board. Teams take turns rolling 1 die. All teams use the same number rolled on each turn.
3. Each team takes as many single Snap Cubes or as many sticks of Snap Cubes as the number rolled. For example, if a 2 is rolled, a team may take 2 single Snap Cubes or 2 sticks of Snap Cubes.



4. Teams place the Snap Cubes or the sticks of Snap Cubes on their game boards. Whenever a team has 10 single Snap Cubes on the board, it must trade them for a Snap Cube stick.
 5. The die may be rolled up to 6 times. Then the game must end.
 6. Teams count how many cubes are on their grids and write that number down.
 7. The team that comes closest to having 100 squares covered without going over 100 is the winner.
- Play several games of *Closest to 100*.
 - Be ready to talk about good moves and bad moves.

The Bigger Picture

Thinking and Sharing

Invite children to talk about their games and some of the thinking they did.

Use prompts such as these to promote class discussion:

- ◆ What strategies did you and your partner use?
- ◆ Did any team cover exactly 100 squares?
- ◆ Which of your scores was closest to 100? How close was it?
- ◆ Who got a score that was far from 100? How far was it?
- ◆ What helped you decide whether to pick single cubes or cube sticks?

Writing and Drawing

Have children color a blank game board to show what it might look like if they rolled a 4, then a 3, then a 5. Have them compare their results, noting the number of cubes pictured and how far away that number is from 100.

Extending the Activity

1. Have children play the game in reverse by starting with 100 cubes on the game board. When they roll a die, they remove that number of cube

Teacher Talk

Where's the Mathematics?

This game gives children a visual experience with place value. If they roll a 3, for instance, they can clearly see the difference between how much of the game board could be covered by 3 single Snap Cubes and how much could be covered by 3 cube sticks (30 Snap Cubes). As the game continues, children get informal practice adding tens and ones to get a sum. They will see that adding additional sets of 10 does not change the number of ones. For example, if there are 22 Snap Cubes on the board and 3 sticks are added, this results in 52 cubes (5 sticks plus 2 singles). Children will see that the number of cube sticks has increased but the number of single cubes has remained at 2.

On the other hand, adding single cubes may have an impact on the number of cube sticks, as well as the number of ones. For example, if there are 37 Snap Cubes (3 sticks and 7 singles) on the board and 4 cubes are added, this will require a trade of 10 single cubes for a cube stick. This would result in 4 sticks and 1 single cube, changing both the number of cube sticks and the number of ones. Seeing how adding tens and ones affects the number of cube sticks and single cubes may help children form a mental picture of addition in their later work with algorithms. It may also strengthen their facility with mental math techniques.

As children gain experience with this game, they will see that they need to estimate. If children take too many tens, they will go over the target number, 100. If they take too many ones, they will not get close enough to 100. Partners must discuss the best way to optimize their chances of getting as close to 100 as possible without going over.

sticks or single cubes. At some point, they may have to trade a cube stick for 10 single cubes before they can complete their turn. After six rolls of the die, the team that is closest to having no cubes left on the board is the winner.

2. Have children work with a partner to figure out six rolls of the die that would give exactly 100 cubes. Ask them to write down what the rolls of the die would be and tell whether they should take cube sticks or single cubes with each roll.

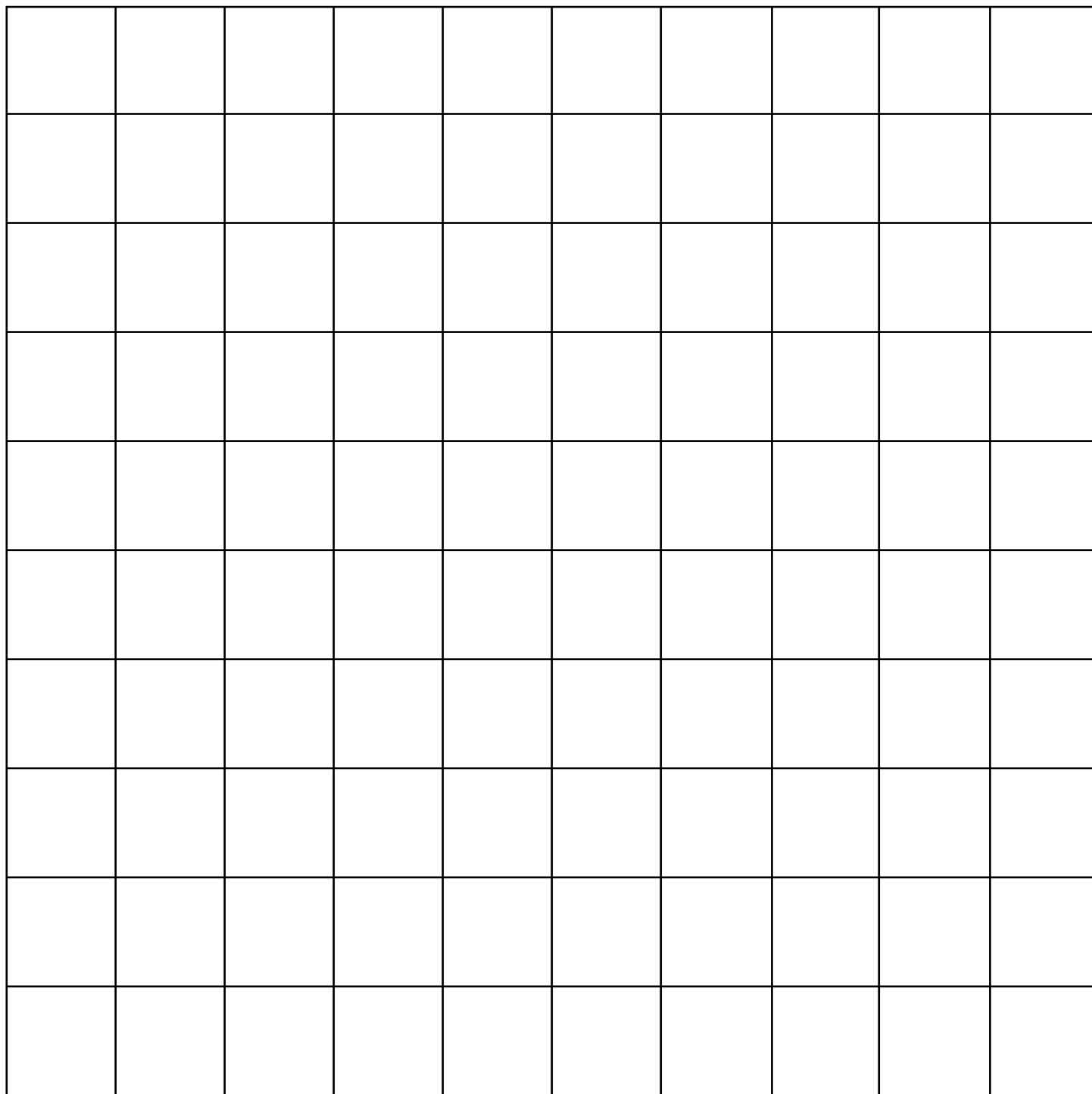
There is no one best strategy for playing the game, and the children will probably have several different suggestions. Some that are typical are: "Take tens until you get past 50. Then be careful," "If the roll is a 3 or less, take tens," "Get to 80 by using tens as soon as you can. Then take ones," "If the other team is really close to 100, they might go over, so you can take ones and still be OK."

Watching their game boards fill up fast as they add cube sticks and slowly as they add single cubes will eventually help children predict which rolls of the die will help them in the latter part of the game. Some will enjoy keeping a running total of how many cubes are on the game board. Others will wait until the end of the game and then find the total. Some children will count by tens to facilitate finding the total.

When asked how close to 100 they got, many children will use the technique of "counting up" and simply count the number of blank spaces left on the board. Some may inadvertently think of this process in terms of both addition and its inverse, subtraction. For example, if 91 cubes were on the board, the child who counts up will discover that only 9 more are needed to get to 100; hence $91 + 9 = 100$. They may be encouraged to also view this situation as $100 - 91 = 9$ and thus be introduced to addition and subtraction as inverse operations.

Finally, children will see that covering exactly 100 squares is not easy. Most of the winning scores will be in the 90s with an occasional score in the 80s and few perfect 100s.

CLOSEST TO 100 GAME BOARD



SNAP CUBE GRID PAPER

