Left Overs

Dividing by ten
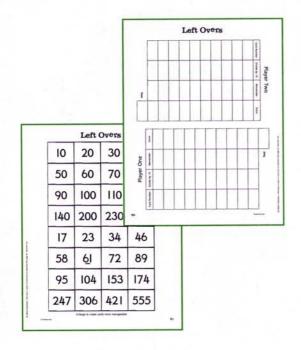
Purpose

In this game, the students use place value to divide two- and three-digit numbers by ten with and without remainders.

Materials

Each pair of players will need

- A 'Left Overs' score sheet (page 50) as shown below.

- One (1) set of numeral cards. Copy page 51 as shown below. Cut out and laminate the cards to make one set.

Left Overs

10	20	30	
50	60	70	
90	100	110	
140	200	230	
17	23	34	46
58	61	72	89
95	104	153	174
247	306	421	555

How to Play

The aim is to achieve the greater score.

- The cards are shuffled and placed face down in a stack.

- The first player draws the top card and records the number in the 'Card Number' column on his or her score sheet.

- The player then divides the number by ten and records the answer and remainder in the next two columns.

- If the number divides evenly by 10, the player scores and writes '10' in the 'Score' column. If there is a remainder, the player does not score.

- The card is discarded to one side.

- The other player has a turn.

- The player with the greater total score after ten rounds is the winner.

Example: The score sheet below shows one player's results after three rounds.

Card Number	Divide by 10	Remainder	Score
50	5	0	10
72	7	2	
421	42	1	
230	23	0	10

Reading the Research

Children who understand the statement "eight crayons in a box" may not understand "eight per box." Children need help in linking the various ways of describing multiplication and division to the interpretations and representations that make sense to them (Kouba & Franklin, 1993).

Before the Game

Write a two-digit multiple of ten on the board. Ask the students to divide it by ten. Repeat this for other two- and three-digit multiples of ten. Invite students to share their methods. The responses will vary, but one student may say, *I just ignore the zero.* If so, ask students why they think this works. Can they see that if 230 is divided by 10 to give 23, the value of the '2' changes from 2 hundreds to 2 tens and the value of the '3' changes from 3 tens to 3 ones? Ask students what happens when a number that does not end in zero is divided by 10. Use an example such as 231 to show that the 'ones' digit becomes the remainder.

During the Game

Ask students to explain how they derived their answers. For example, a student may say, *I turned up 280. When I divide by ten, the '2' changes from 200 to 20 and the '8' changes from 80 to 8. The answer is 28.* To divide 306 by 10, a student may say, *I know 300 divided by 10 is 30 and I have 6 left over.*

Encourage the students to verbalize the link between multiplication and division. For example, a student may say, *I know 80 ÷ 10 is 8, because 10 x 8 is 80.* For numbers that are not multiples of 10, a student may say, *153 ÷ 10 is 15 with 3 left over, because 10 x 15 = 150 plus 3 = 153.*

After the Game

Ask students to give examples of numbers that could be divided by 10 to give a remainder of 3. Can they see that any number (greater than 10) which has 3 in the 'ones' column will have a remainder of 3? Allow students to suggest numbers greater than 1000, such as 1563 or 4623.

Challenge the students to list all the numbers between 100 and 200 that when divided by 10 have no remainder. Ask them to identify all the two-digit numbers that have a remainder of 5 when divided by 10.

Beyond the Game

- Change the way in which the players score points. In a different version of the game, the remainder can become the score. For example, if a player draws 247, the remainder is 7 so the player scores 7. In this game, turning up a multiple of 10 is a disadvantage.

- Ask real-world questions involving remainders, for example, *If a box can hold 10 pencils, how many boxes would you need to hold 53 pencils?* Can students see that six boxes would be needed and that one pack would only contain three pencils?

Left Overs

Player Two

Card Number	Divide by 10	Remainder	Score
Total			

Player One

Score	Remainder	Divide by 10	Card Number
Total			

Fundamentals

Left Overs

10	20	30	40
50	60	70	80
90	100	110	120
140	200	230	280
17	23	34	46
58	6<u>1</u>	72	89
95	104	153	174
247	306	421	555