Lesson Plan Outline for Introducing Long Division in 4ᵗʰ Grade

- Day #1: Warmup day. Practice doing a fair bit of mental math with multiplying problems with zeroes (e.g., 400x6 and 70x30). State the question at the end of class: In the next two weeks we will learn how to do long division with big problems, like 3185÷5. How can we do this?

- Day #2 (Acting it out): Act out 465÷5=93 with monopoly money and five students. The story is simple: I found $465 in a bag, and decided to divide it evenly between my five friends. Try giving away these amounts each time: 60, 20, 5, 3, 5. After each "round" of giving away, we ask how much do I now have in my bag? At the end, we ask, how much money does each person have? Nothing gets written down.

- Day #3 (**Story Long Division**): Review orally what we did yesterday, recalling all of the details. Then go through it all again, writing in in "Story Long Division" form with two columns saying "Bag" and "Person". Then, do a second problem 3336÷4=834, again with money, and students at the front of the room acting as the friends. Then the students sit down, and you write it on the board in "Story Long Division" form.

Bag		**Person**
3336		
− 2000	← x4 ←	500
1336		
− 400	← x4 ←	100
936		
− 800	← x4 ←	200
136		
− 100	← x4 ←	25
36		
− 20	← x4 ←	5
16		
− 16	← x4 ←	+ 4
0		834

- Day #4 (Students solve problems in groups): Review the second problem 3336÷4=834 by rewriting (in Story Long Division form) it on the board. Then do it second time, but with giving away different amounts. (You don't need to use money or have students at the front of the room for the second method.) Show the second method on the board next to the first method. Then have the students do a new problem (564÷3=188) in four-person groups. Each group needs to have $564 in monopoly money. (The teacher is the bank, making change as needed.)

- Day #5 (**Flexible Long Division**): Write all the different ways on the board that the groups did yesterday's problem. Do a new problem (2292÷6) and the solution both in Story Long Division form and a new way: Flexible Long Division (see below). Then do new problems in groups, but this time without using money, such as: 348÷4=87   486÷3=162   1880÷5=376

$$2292 \div 6 = 382$$

6	2292		200
	− 1200		150
	1092		20
	− 900		+ 12
	192		**382**
	− 120		
	72		
	− 72		
	0		

- Day #6: On the board, show 2024÷8=253 with both forms (Story Long Division and Flexible Long Division). Then have the students do these problems in groups: 261÷3=87   1215÷5=243; 1152÷6=192   28,638÷9=3182 Emphasize that it's OK if you make mistakes, and OK if it takes you a while. Mention that tomorrow we'll do one problem in groups, and then you'll do it on your own.

- Day #7: Only do Flexible Long Division from now on.
  On the board: 1281÷3=427
  In groups: 685÷5=137
  On your own: 504÷4=126   3185÷5=637
  517÷11=47   32,832÷12=2736

- Day #8: More practice. At the end, mention that next year we will learn "Shortcut Long Division"

- Future Steps:
  - Do some practice of Flexible Long Division later in 4ᵗʰ grade.
  - In 5ᵗʰ grade, review Flexible Long Division, and then ask how can we do it more efficiently, where each step gives the "perfect" number of hundreds, tens and ones? E.g., with 1925÷5, the answer is then written 300+80+3 above the house, as a transition to to "Shortcut (normal) Long Division".
  - In 6ᵗʰ grade answers can include repeating decimals.