

What to bring to class:
Ask students to bring PM
4A and 5A.

3.4 Long Division

- * Most Important algorithm taught in elementary school
- * Helps understand "successive approx"
(comes up often in math, science, computer science)
- * Relating fractions & decimals; irrationals

Prereq's

- 1) Place Value
- 2) 1-digit "x" & "÷"
- 3) quotient & remainder
- 4) Long div. notation $28 \div 3 \longleftrightarrow 3 \overline{)28}$
- 5) Estimation (in 3.5)

Taught in 3 stages (can use Partitive or Measurement)

- ask for these first.
- 1) 1-digit divisors $3 \overline{)68}$
 - 2) Estimation: Transition step
 - 3) 2-digit divisors

$$56 \overline{)4832}$$

$$56 \overline{)4832} \circ \circ \circ$$

think

$$\approx 60 \overline{)4800}^{30}$$

uses estimation

Stage 1:

Partitive approach

Ex: Ms Davis divided 13 candies equally among 4 children.

Each child had _____ candies
 with a total of _____ distributed
 and _____ left over

} 3 # to keep track of.

[Note: This is quotient-remainder thm: $13 = (4 \times _) + _$]

$13 \div 4 = 3R1$

Record as

	3	←	# to each child
	4 13	←	# distributed
	12	←	left to distribute
	1	←	

Ex: Ann, Beth & Camile split \$8.82 equally. How much did each get?

1) Distribute dollars

two left. convert
to dimes
→ 28 dimes

	2	←	\$2 each
	3 8.82	←	distribute \$6
	6.	←	
	2.8	←	

2) Distribute dimes

1 dime left. Convert
to pennies
→ 12 pennies

	29	←	9 dimes each
	3 8.82	←	
	6.	←	
	2.8	←	27 dimes distributed
	2.7	←	
	1.2	←	

3) Distribute pennies

Done

	294	←	4 pennies each
	3 882	←	
	6	←	
	28	←	
	27	←	
	12	←	12 distributed
	12	←	0 left
	0	←	

Observe:

- * Essential role of Place Value
- * Each step same distribute, record, make change
- * Steps give better & better approximations

$$200 \rightsquigarrow 290 \rightsquigarrow 294$$

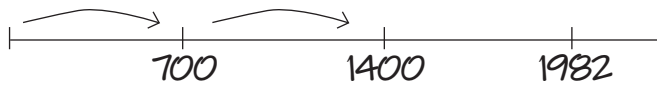
(say: one more correct digit each time)

Repeated subtraction approach (say: similar-uses meas model)

Ex: Find $1984 \div 7$

Think: How many 7's in 1984? (what type of interpretation? Multi-Digit)

1) Flying leaps - 100 length 7 steps at a time

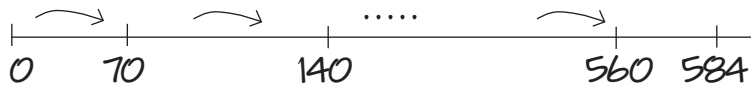


200 steps = 1400

leaves 584 to go

$$\begin{array}{r} 2 \\ 7 \overline{)1984} \\ \underline{1400} \\ 584 \end{array}$$

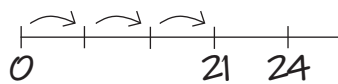
2) Giant Leaps - 10 length 7 steps at a time



80 steps = 560
leaves 24

$$\begin{array}{r} 283 \\ 7 \overline{)1984} \\ \underline{1400} \\ 584 \\ \underline{560} \\ 24 \\ \underline{21} \\ 3 \end{array}$$

3) Length 7 steps



3 steps = 21, leaves 3

This completes stage 1. Next time stage 2 & then 3.

HW - Read 3.4

do HW #13

bring PM 4A & Workbook 5A

