

Ch. 2 Multiplication Intro

9/4/24

(8) $=$ (4) $\times$ (2)
 $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$
 8 is 4 times 2
 has as many
 was many

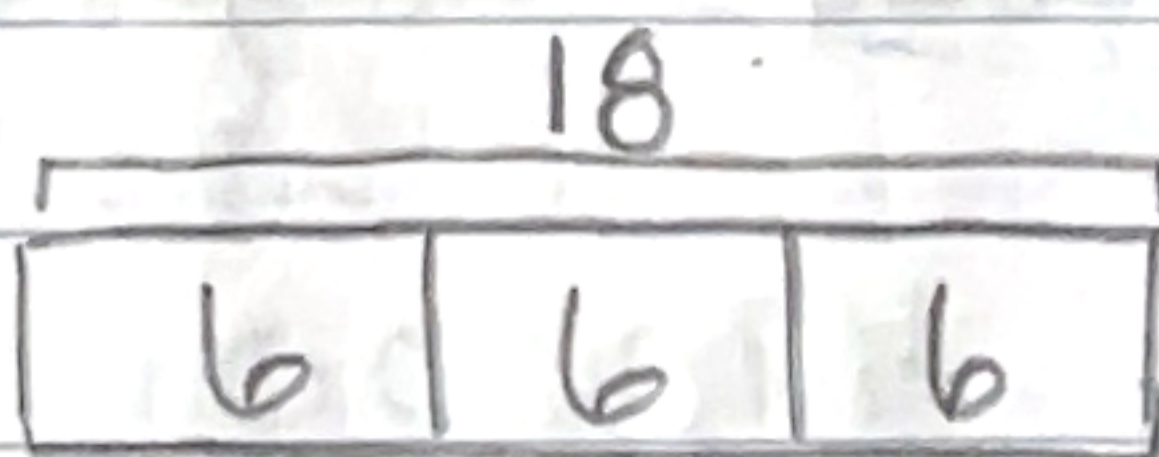
(3) times as many as (8) is (24) .
 $\downarrow$ $\downarrow$ $\downarrow$
 3 $\times$ 8 = 24

$$3 \times 8 = 24$$

$$24 = 3 \times 8$$

$$8 \times 3 = 24$$

$$24 = 8 \times 3$$



$[6]$ $\leftarrow$ key

$$3 \times 6 = 18$$

$$6 \times 3 = 18$$

$$18 = 6 \times 3$$

$$18 = 3 \times 6$$

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Ch. 2 Basic Facts

$$9 \times 1 = 9$$

$$90 \times 100 = 9,000$$

$$900 \times 1,000 = 900,000$$

$$50 \times 600 = 30,000$$

$$50,000 \times 6,000 = 300,000,000$$

$$800 \times 50 = 40,000$$

$$300 \times 120 = 36,000$$

$$6,000,000 \times 30,000 = 180,000,000,000$$

$$11,000 \times 90 = 990,000$$

$$2,000 \times 50 = 100,000$$

Ch. 2 Estimation

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$$9 \times 3,281 \approx 27,000$$

$$\begin{array}{r} \textcircled{2} \textcircled{7} \\ 3 \cancel{2} 81 \\ \times \quad \quad 9 \\ \hline 29,529 \end{array} \rightarrow \begin{array}{r} 3 \textcircled{000} \\ \times \quad 9 \\ \hline 27000 \end{array} \downarrow *$$

About

$$499 \times 8$$

$$\begin{array}{r} \textcircled{7} \textcircled{7} \\ 4 \cancel{9} 9 \\ \times \quad \quad 8 \\ \hline 3992 \checkmark \end{array} \rightarrow \begin{array}{r} 5 \textcircled{00} \\ \times \quad 8 \\ \hline 4000 \checkmark \end{array} \uparrow$$

$$\begin{array}{r} \textcircled{5} \textcircled{2} \textcircled{1} \\ 3 \cancel{9} 421 \\ \times \quad \quad 6 \\ \hline 236,526 \end{array} \rightarrow \begin{array}{r} 4,0000 \\ \times \quad 6 \\ \hline 240,000 \end{array} \uparrow$$

$$\begin{array}{r} \textcircled{9} \textcircled{9} \\ 9 \cancel{9} \\ \times \quad 9 \\ \hline \end{array} \rightarrow \begin{array}{r} 100 \\ \times 9 \\ \hline 900 \end{array} \uparrow$$

$$\begin{array}{r} 3,00,008 \\ \times \quad \quad 7 \\ \hline \end{array} \rightarrow \begin{array}{r} 30,0000 \\ \times \quad \quad 7 \\ \hline 2,100,000 \end{array} \downarrow$$

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Ch. 2

Distributive Property

Distributive Property

Multiplying a sum by a number is the same as multiplying each number in the parenthesis by that number and then adding them together.

(think: "the only one with addition and multiplication in the same problem")

$$6 \times 13$$

think

$$6 \times (10 + 3)$$

now think

$$6 \times (10 + 3) = (6 \times 10) + (6 \times 3)$$

$$60 + 18 = 78$$

$$6 \times (7 + 6) = 6 \times 7 + 6 \times 6 = 42 + 36$$

$$\begin{array}{r} 42 \\ + 36 \\ \hline 78 \end{array}$$

$$5 \times 46 = \underline{230}$$

✓1. Expand.

✓2. Distribute

✓3. $\otimes$

✓4. $\oplus$

$$(5 \times) (40 + 6)$$

$$(5 \times 40) + (5 \times 6)$$

$$200 + 30$$

$$230$$

$$9 \times 186 = \underline{1674}$$

$$(9 \times) (100 + 80 + 6)$$

$$(9 \times 100) + (9 \times 80) + (9 \times 6)$$

$$900 + 720 + 54$$

$$\begin{array}{r} 900 \\ 720 \\ + 54 \\ \hline 1674 \end{array}$$

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Ch. 2 Area Model

$$7 \times 31 =$$

$$7 \times (30 + 1)$$

30	1
7×30	7×1
210	7

$$\begin{array}{r} 210 \\ + 7 \\ \hline 217 \end{array}$$

$$4 \times 58 =$$

50	8
4×50	4×8
200	32

$$\begin{array}{r} 200 \\ + 32 \\ \hline 232 \end{array}$$

$$7 \times 198 = \underline{1386}$$

	100	90	8
7	700	630	56

$$\begin{array}{r}
 700 \\
 630 \\
 + 56 \\
 \hline
 1386
 \end{array}$$

$$6 \times 1896 = \underline{\hspace{2cm}}$$

	1000	800	90	6
6	6000	4800	540	36

$$\begin{array}{r}
 6000 \\
 4800 \\
 540 \\
 + 36 \\
 \hline
 11,376
 \end{array}$$

$$9 \times 430,609 = \underline{\hspace{2cm}}$$

	4000000	300000	0	6000	0	9
9	3600000	270000	0	5400	0	81

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9/11/24 Ch. 2 Also Partial Products

$$5 \times 835 = \underline{4175}$$

$$5 \times (800 + 30 + 5)$$

$$5 \times 800 = 4000$$

$$5 \times 30 = 150$$

$$5 \times 5 = + 25$$

$$\underline{4175}$$

$$\text{Est } \underline{700}$$

$$\begin{array}{r} \uparrow \quad 1 \boxed{3} 2 \\ \times \quad 7 \\ \hline 7 \times 2 = 14 \\ 7 \times 30 = 210 \\ 7 \times 100 = + 700 \\ \hline \boxed{924} \checkmark \end{array} \quad \begin{array}{r} \rightarrow \quad 1 \boxed{00} \\ \times \quad 7 \\ \hline 700 \end{array} \quad \downarrow$$

$$7 \times 2 = 14$$

$$7 \times 30 = 210$$

$$7 \times 100 = + 700$$

$$\boxed{924} \checkmark$$

$$\text{EST: } \underline{3600}$$

$$\begin{array}{r} \uparrow \quad 4 \boxed{1} 2 \\ \times \quad 9 \\ \hline 9 \times 400 = 3600 \\ 9 \times 10 = 90 \\ 9 \times 2 = + 18 \\ \hline 3708 \end{array} \quad \begin{array}{r} \rightarrow \quad 4 \boxed{00} \\ \times \quad 9 \\ \hline 3600 \end{array} \quad \downarrow$$

$$9 \times 400 = 3600$$

$$9 \times 10 = 90$$

$$9 \times 2 = + 18$$

$$\underline{3708}$$

EST: 2000

$$\begin{array}{r}
 \uparrow \\
 3 \overline{) 62} \rightarrow 400 \\
 \downarrow \times 5 \rightarrow \boxed{2000}
 \end{array}$$

$$5 \times 300 = 1500$$

$$5 \times 60 = 300$$

$$5 \times 2 = + 10$$

$$\boxed{1810}$$

(2) (1) (1) (1)

(2) (1)

18

9/13/24

Ch. 2 Old School (X)

$$36 \times 3$$

	30	6
3	3×30	3×6
	90	18

$$\begin{array}{r} 90 \\ + 18 \\ \hline 108 \end{array}$$

$$36 \times 3$$

$$\begin{array}{r} \textcircled{1} 36 \\ \times \quad 3 \\ \hline 108 \end{array}$$

$$\begin{array}{r} 18 \\ 90 \\ \hline 108 \end{array}$$

$$\begin{array}{r} 312 \\ \times \quad 4 \\ \hline 1248 \end{array}$$

	300	10	2
4	1200	40	8

$$\begin{array}{r} 1200 \\ 40 \\ 8 \\ \hline 1248 \end{array}$$

$$\begin{array}{r} \textcircled{3} \textcircled{4} \\ 269 \\ \times \quad 5 \\ \hline 1345 \end{array}$$

$$\begin{array}{r} \textcircled{1} \textcircled{3} \textcircled{2} \textcircled{4} \\ 21436 \\ \times \quad 8 \\ \hline 171488 \end{array}$$

$$\begin{array}{r}
 \textcircled{3} \textcircled{4} \textcircled{4} \textcircled{3} \textcircled{0} \\
 1, 798, 602 \\
 \times 5 \\
 \hline
 8,993,010
 \end{array}$$

$$\begin{array}{r}
 \textcircled{1} \textcircled{1} \textcircled{0} \textcircled{1} \textcircled{1} \textcircled{1} \textcircled{1} \\
 128,740,976,406 \\
 \times 2 \\
 \hline
 257,481,952,812
 \end{array}$$

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9/14/24 Ch. 2 The Biggies

$$\begin{array}{r}
 \textcircled{1} \textcircled{3} \textcircled{6} \textcircled{6} \\
 \uparrow \\
 \begin{array}{r}
 32489 \\
 \times \quad 7 \\
 \hline
 227,423
 \end{array}
 \end{array}
 \rightarrow
 \begin{array}{r}
 \textcircled{30000} \\
 \times \quad 7 \\
 \hline
 210,000
 \end{array}$$

$$\begin{array}{r}
 \textcircled{1} \textcircled{3} \textcircled{1} \\
 \uparrow \\
 \begin{array}{r}
 53721 \\
 \times \quad 5 \\
 \hline
 268,605
 \end{array}
 \end{array}
 \Rightarrow
 \begin{array}{r}
 \textcircled{50000} \\
 \times \quad 5 \\
 \hline
 250,000
 \end{array}$$

← just rounding
← EST

$$\begin{array}{r}
 \textcircled{2} \textcircled{3} \textcircled{4} \textcircled{1} \\
 \uparrow \\
 \begin{array}{r}
 7,346,201 \\
 \times \quad 8 \\
 \hline
 58,769,608
 \end{array}
 \end{array}
 \rightarrow
 \begin{array}{r}
 7,000,000 \\
 \times \quad 8 \\
 \hline
 \textcircled{56,000,000}
 \end{array}$$

EST

$$\begin{array}{r}
 \textcircled{1} \textcircled{1} \textcircled{2} \quad \textcircled{3} \\
 \uparrow \\
 \begin{array}{r}
 444,600,921 \\
 \times \quad 4 \\
 \hline
 1,778,403,684
 \end{array}
 \end{array}
 \rightarrow
 \begin{array}{r}
 \textcircled{4000000000} \\
 \times \quad 4 \\
 \hline
 16,000,000,000
 \end{array}$$

Ch. 2 Order of Operations

9/17/24

Parenthesis

~~Exponents~~

PEMDAS

Multiplication

Division

Addition

Subtraction

in order from
L to R

$$21 \div 3 + (6 \times 2) = 19$$

$$21 \div 3 + 12$$

$$7 + 12$$

$$19$$

$$6 + 4 \times 8 = 38$$

$$6 + 32$$

$$38$$

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PEMDAS

$$47 + 8 \div 4 + 6 = 55$$

$$47 + 2 + 6$$

$$49 + 6 = 55$$

$$25 \div 5 \times 6 - 3 = 27$$

$$5 \times 6 - 3 =$$

$$30 - 3$$

$$27$$

$$25 \times 319$$

$$3 \times 399$$

~~A. $25 \times (320 + 1) 321$~~

~~B. $(20 + 5) \oplus 319$~~

$$\checkmark \text{C. } 25 \times (320 - 1) 319$$

~~D. 26×318~~

~~A. $(1 + 2^3) \oplus (300 + 99)$~~

~~B. $(4 - 3) \times (400 - 1)$~~

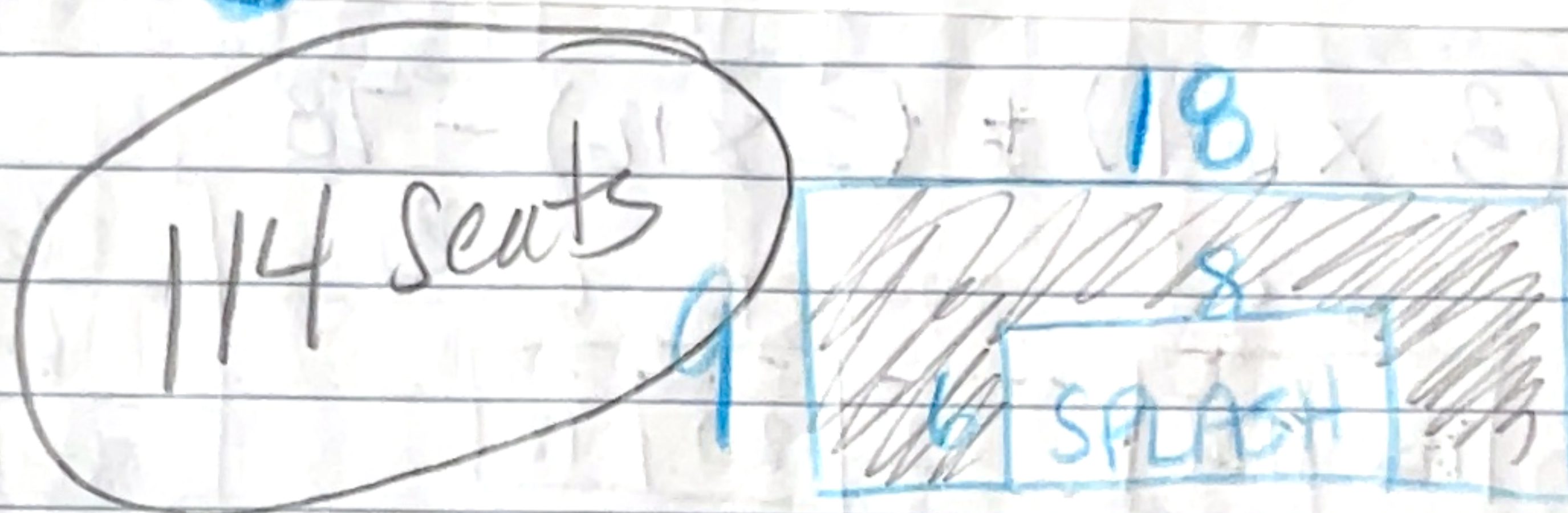
$$\checkmark \text{C. } (4 - 3) \times (402 - 3)$$

~~D. $(4 + 1) \times (402 - 3)$~~

Ch. 2 Multi-step

9/18/24

At the sea park, one section of the stadium has 9 rows with 18 seats in each row. In the center of each of the first 6 rows, 8 seats are in the splash zone. How many seats are NOT in the splash zone?



$$(9 \times 18) - (6 \times 8)$$

$$\begin{array}{r} 162 - 48 \\ \hline 114 \end{array}$$

$$9 \begin{array}{|c|c|} \hline 90 & 72 \\ \hline \end{array}$$

$$\begin{array}{r} 90 \\ + 72 \\ \hline 162 \end{array}$$

$$\begin{array}{r} 162 \\ - 48 \\ \hline 114 \end{array}$$

$$\begin{array}{r} 18 \quad 8 \\ \times 9 \quad \times 6 \\ \hline 162 \quad 48 \end{array}$$

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Ch. 2 Mo' Multi-step

Bob's computer has 3 hard drives with 64 gigabytes of space each and 2 hard drives with 16 gigabytes of space each. The files on computer use 78 gigabytes of space. How much hard drive space does his computer have left?

$$(3 \times 64) + (2 \times 16) - 78$$

$$\begin{array}{r} 60 \quad 4 \\ 3 \overline{) 180} \quad 12 \end{array}$$

180

+ 12

192

⊕

①

192

+ 32

224

$$\begin{array}{r} 10 \quad 6 \\ 2 \overline{) 20} \quad 12 \end{array}$$

20

+ 12

32

⊖ 78

11

224

- 78

146

gb

64
64
64
16
16