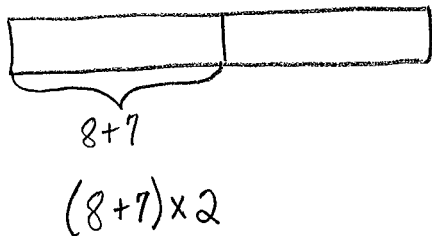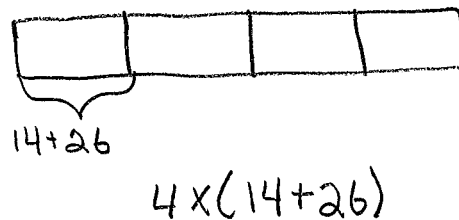Name _____   Date _____

1. Draw a model. Then write the numerical expressions.
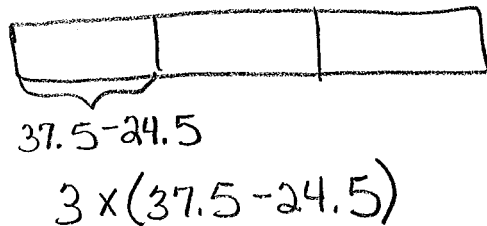
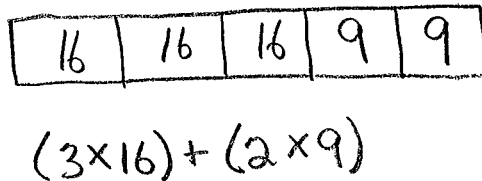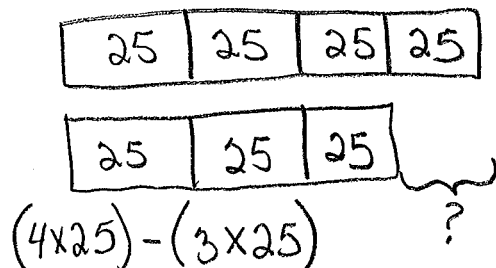| a. The sum of 8 and 7, doubled	b. 4 times the sum of 14 and 26
$8+7$ $(8+7) \times 2$	$14+26$ $4 \times (14+26)$
c. 3 times the difference between 37.5 and 24.5	d. The sum of 3 sixteens and 2 nines
$37.5-24.5$ $3 \times (37.5-24.5)$	16 16 16 9 9 $(3 \times 16)+(2 \times 9)$
e. The difference between 4 twenty-fives and 3 twenty-fives	f. Triple the sum of 33 and 27
25 25 25 25 25 25 25 $(4 \times 25)-(3 \times 25)$?	$33+27$ $(33+27) \times 3$
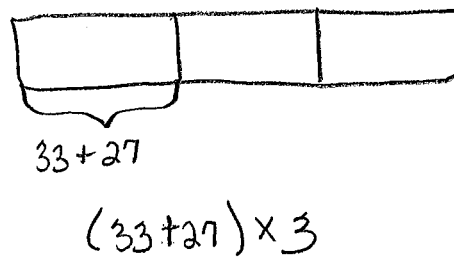
COMMON CORE

Lesson 3:   Write and interpret numerical expressions and compare expressions
              using a visual model.
Date: 7/4/13

engage^ny   2.B.10

2. Write the numerical expressions in words.

Expression	Words	The Value of the Expression
a. $12 \times (5 + 25)$ 30	12 times the sum of 5 and 25	360
b. $(62 - 12) \times 11$ 50	11 times the difference of 62 and 12	550
c. $(45 + 55) \times 23$ 100	23 times the sum of 45 and 55	2,300
d. $(30 \times 2) + (8 \times 2)$ 60 + 16	the sum of 30 twos and 8 twos	76

3. Compare the two expressions using >, <, or =. In the space beneath each pair of expressions, explain how you can compare without calculating. Draw a model if it helps you.

a. $24 \times (20 + 5)$ 24×25 This is greater b/c it is 24 groups of 25 and the right is 12 groups of 25.	$>$	$(20 + 5) \times 12$ 25×12
b. 18×27 The right is less b/c it is 18 × 27 and the right is 19 × 27	$<$	20 twenty-sevens minus 1 twenty-seven $(20 \times 27) - 27$ 19×27
c. 19×9 [19][19][19][19][19][19][19][19][19]	$=$	3 nineteens, tripled $(3 \times 19) \times 3$ [19][19][19] [19][19][19] [19][19][19] 19×9

COMMON CORE

Lesson 3: Write and interpret numerical expressions and compare expressions using a visual model.

Date: 7/4/13

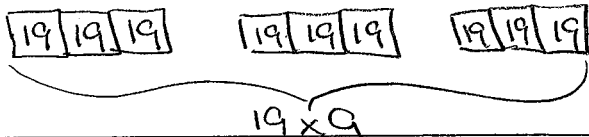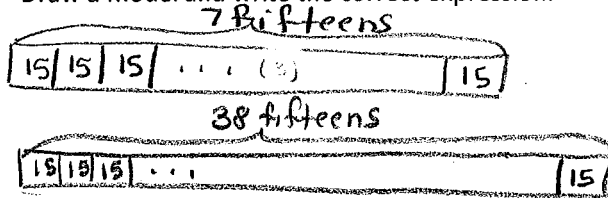engage^{ny}　2.B.11

4. Mr. Huynh wrote *the sum of 7 fifteens and 38 fifteens* on the board.
   a. Draw a model and write the correct expression.

$(7 \times 15) + (38 \times 15)$

5. Two students wrote the following numerical expressions.

   Angeline: $(7 + 15) \times (38 + 15)$

   MeiLing: $15 \times (7 + 38)$

   Are the students' answers equivalent to your answer in Problem 4(a)? Explain your answer.

   Angeline's answer is not correct, MeiLing's answer would be equivalent because you would need (7+38 total 15's.

6. A box contains 24 oranges. Mr. Lee ordered 8 boxes for his store and 12 boxes for his restaurant.
   a. Write an expression to show how to find the total number of oranges ordered.

$(24 \times 8) + (24 \times 12)$ OR $24 \times (8 + 12)$
OR 24×20

   b. Next week, Mr. Lee will both double the number of boxes he orders. Write a new expression to represent the number of oranges in next week's order.

$((24 \times 8) + (24 \times 12)) \times 2$ OR $(24 \times 20) \times 2$

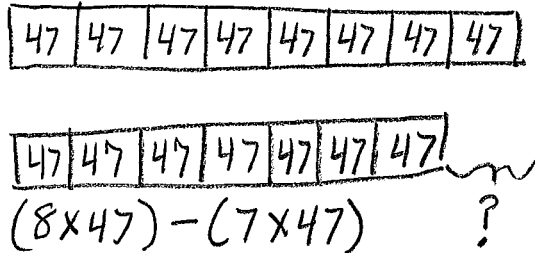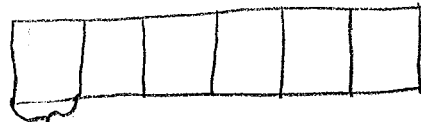   c. Evaluate your expression from Part (b) to find the total number of oranges ordered in both weeks.

Week 1: $(24 \times 20) = 480$ oranges

Week 2: $(24 \times 20) \times 2 = 960$ oranges

$$480 + 960 = 1440 \text{ oranges}$$

Mr. Lee ordered 1440 oranges in both weeks.

COMMON CORE | Lesson 3: | Write and interpret numerical expressions and compare expressions using a visual model.
Date: | 7/4/13
engage^ny | 2.B.12

Name _____   Date _____

1. Draw a model then write the numerical expressions.

a. The difference between 8 forty-sevens and 7 forty-sevens	b. 6 times the sum of 12 and 8
47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 ∿ $(8 \times 47) - (7 \times 47)$?	$12 + 8$ $6 \times (12 + 8)$

2. Compare the two expressions using >, <, or =.

62 × (70 + 8)	⊘	(70 + 8) × 26

It's greater than because the left side shows
62 groups of (70+8) but the right only has
26 groups of (70+8)

COMMON CORE | Lesson 3: | Write and interpret numerical expressions and compare expressions using a visual model.
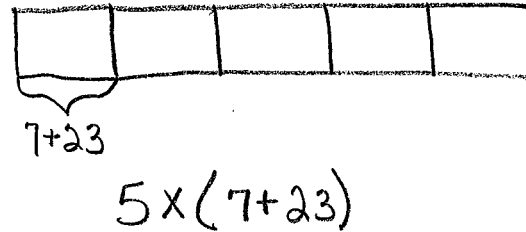| Date: | 7/4/13

engage^ny   2.B.13

Name _____   Date _____

1. Draw a model then write the numerical expressions.

a. The sum of 21 and 4, doubled	b. 5 times the sum of 7 and 23
21+4 (21+4) × 2	7+23 5 × (7+23)
c. 2 times the difference between 49.5 and 37.5	d. The sum of 3 fifteens and 4 twos
49.5-37.5 2 × (49.5-37.5)	15 15 15 2 2 2 2 (3×15) + (4×2)
e. The difference between 9 thirty-sevens and 8 thirty-sevens	f. Triple the sum of 45 and 55
37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 (9 × 37) − (8 × 37) ?	45 + 55 (45+55) × 3
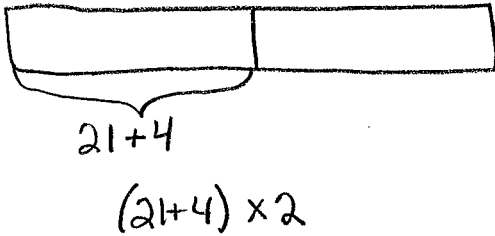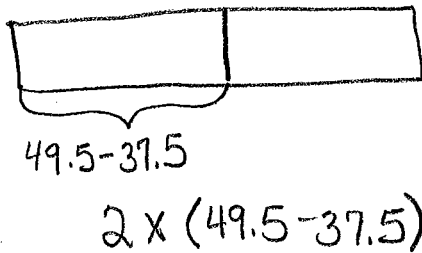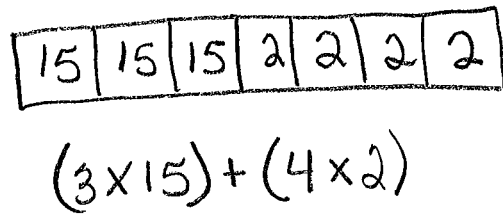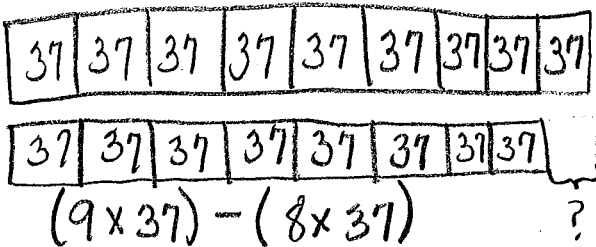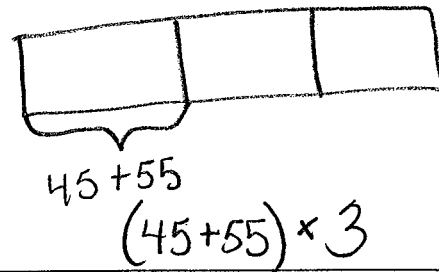
2. Write the numerical expressions in words.

Expression	Words	The Value of the Expression
a. $10 \times (2.5 + 13.5)$	ten times the sum of 2.5 and 13.5	160
b. $(98 - 78) \times 11$	eleven times the difference between 98 and 78	220
c. $(71 + 29) \times 26$	twenty-six times the sum of 71 and 29	2,600
d. $(50 \times 2) + (15 \times 2)$	the sum of 50 twos and 15 twos	130

3. Compare the two expressions using >, <, or =. In the space beneath each pair of expressions, explain how you can compare without calculating. Draw a model if it helps you.

a. $93 \times (40 + 2)$	>	$(40 + 2) \times 39$

It is greater than because the left side shows 93 groups of (40+2) but the right side only has 39 groups of (40+2)

b. 61×25	>	60 twenty-fives minus 1 twenty-five $(60 \times 25) - (1 \times 25)$

It is greater than because the left side is 60 twenty-fives plus 1 twenty-five and the right side is 60 twenty-fives minus 1 twenty-five

4. Larry claims that (14 + 12) × (8 + 12) and (14 × 12) + (8 × 12) are equivalent because they have the same digits and the same operations.

   a. Is Larry correct? Explain your thinking.

   Larry is incorrect because you are doing different operations with the same groups producing different answers.

   b. Which expression is greater? How much greater?

$$(14+12) \times (8+12)$$
$$26 \times 20$$
$$520$$

$$(14 \times 12) + (8 \times 12)$$
$$168 + 96$$
$$264$$

$$\begin{array}{r} 14 \\ \times 12 \\ \hline 28 \\ 140 \\ \hline 168 \end{array}$$

$$\begin{array}{r} 168 \\ + 96 \\ \hline 264 \end{array}$$

$(14+12) \times (8+12)$ is 256 greater than $(14 \times 12) + (8 \times 12)$.

$$\begin{array}{r} \overset{4}{\cancel{5}}\overset{11}{\cancel{2}}0 \\ - 264 \\ \hline 256 \end{array}$$

COMMON CORE | Lesson 3: | Write and interpret numerical expressions and compare expressions using a visual model.
Date: | 7/4/13
engage^ny | 2.B.16

Name _____   Date _____

1. Circle each expression that is not equivalent to the expression in **bold**.

   a. **16 × 29**

   29 sixteens   16 × (30 − 1)   (15 − 1) × 29   (10 × 29) − (6 × 29)

   b. **38 × 45**

   (38 + 40) × (38 + 5)   (38 × 40) + (38 × 5)   45 × (40 + 2)   45 thirty-eights

   c. **74 × 59**

   74 × (50 + 9)   74 × (60 − 1)   (74 × 5) + (74 × 9)   59 seventy-fours

2. Solve using mental math. Draw a tape diagram and fill in the blanks to show your thinking. The first one was done for you.

   a. 19 × 25 = ___*19*___ twenty-fives

25	25	25	...	25	25
1	2	3	...	19	20

   Think: 20 twenty-fives − 1 twenty-five.

   = (__*20*__ × 25) − (__*1*__ × 25)

   = __*500*__ − __*25*__ = __*475*__

   b. 24 × 11 = ___*11*___ twenty-fours

24	24	24	...		24
1	2	3			

   10 twenty-fours   *1 twenty-four*

   Think: __*10*__ twenty fours + __*1*__ twenty four

   = (__*10*__ × 24) + (__*1*__ × 24)

   = __*240*__ + __*24*__ = __*264*__

COMMON CORE | Lesson 4: | Convert numerical expressions into unit form as a mental strategy for multi-digit multiplication.
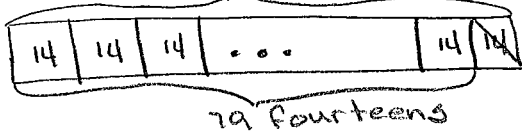Date: | 7/4/13

engage^ny   2.B.23
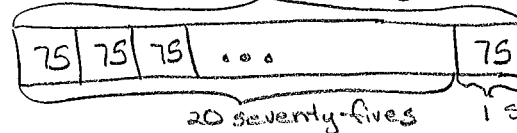
c. $79 \times 14 =$ ___79___ fourteens

80 fourteens

| 14 | 14 | 14 | . . . | 14 | 14 |

79 fourteens

Think: ___80___ fourteens – 1 fourteen

$= ($ ___80___ $\times 14) - ($ ___1___ $\times 14)$

$=$ ___1120___ $-$ ___14___ $=$ ___1106___

3
14
× 80
─────
1120

d. $21 \times 75 =$ ___21___ seventy-fives

21 seventy-fives

| 75 | 75 | 75 | . . . | 75 |

20 seventy-fives   1 seventy-five

Think: ___20___ seventy-fives + ___1___ seventy-five

$= ($ ___20___ $\times 75) + ($ ___1___ $\times 75)$

$=$ ___1500___ $+$ ___75___ $=$ ___1575___

1 seventy-five

1
75
× 20
─────
1500

3. Define the unit in word form and complete the sequence of problems as was done in Problems 3–4 in the lesson.

a. $19 \times 15 = 19$ ___fifteens___

20 fifteens

| 15 | 15 | 15 | . . . | 15 | 15 |
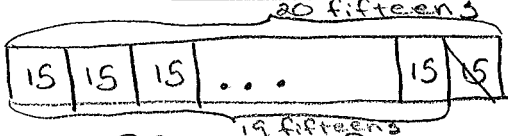
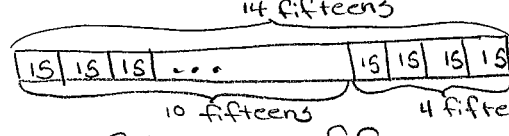19 fifteens

Think: 20 ___fifteens___ – 1 ___fifteen___

$= (20 \times$ ___15___ $) - (1 \times$ ___15___ $)$

$=$ ___300___ $-$ ___15___ $=$ ___285___

15
× 20
─────
300

b. $14 \times 15 = 14$ ___fifteens___

14 fifteens

| 15 | 15 | 15 | . . . | 15 | 15 | 15 | 15 |

10 fifteens   4 fifteens

Think: 10 ___fifteens___ + 4 ___fifteens___

$= (10 \times$ ___15___ $) + (4 \times$ ___15___ $)$

$=$ ___150___ $+$ ___60___ $=$ ___210___

c. $25 \times 12 = 12$ ___twenty-fives___

| 25 | 25 | 25 | . . . | 25 | 25 |
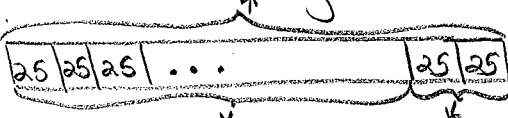
Think: 10 ___twenty-fives___ + 2 ___twenty-fives___

$= (10 \times$ ___25___ $) + (2 \times$ ___25___ $)$

$=$ ___250___ $+$ ___50___ $=$ ___300___

d. $18 \times 17 = 18$ ___seventeens___

20 seventeens

| 17 | 17 | 17 | . . . | 17 | 17 | 17 |
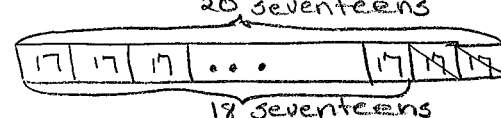
18 seventeens

Think: 20 ___seventeens___ – 2 ___seventeens___

$= (20 \times$ ___17___ $) - (2 \times$ ___17___ $)$

$=$ ___340___ $-$ ___34___ $=$ ___306___

COMMON CORE | **Lesson 4:**   Convert numerical expressions into unit form as a mental strategy for multi-digit multiplication.

Date: 7/4/13   engage^ny   **2.B.24**

4. How can 14 × 50 help you find 14 × 49?

Once I find 50 fourteens, I can subtract 1 fourteen and it will give me 49 fourteens.
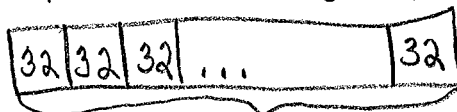
5. Solve mentally.

a. 101 × 15 = __1,515__

(100 × 15) + (1 × 15)

b. 18 × 99 = __1,782__

(100 × 18) − (1 × 18)

6. Saleem says 45 × 32 is the same as (45 × 3) + (45 × 2). Explain Saleem's error using words, numbers, and pictures.

45 × 32 = 45 thirty-twos

(45 × 3) + (45 × 2) = 45 fives

| 32 | 32 | 32 | ... | 32 |

45 thirty-twos

| 5 | 5 | 5 | ... | 5 |
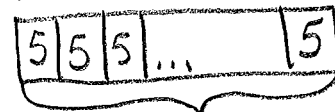
45 fives

They are not the same because 45 thirty-twos does not equal to 45 fives.

7. Juan delivers 174 newspapers every day. Edward delivers 126 more newspapers each day than Juan.
   a. Write an expression to show how many newspapers Edward will deliver in 29 days.

$(174 + 126) \times 29$

   b. Use mental math to solve. Show your thinking.

I first added 174 and 126 to get 300. Then I multiplied 300 times 29 to get 8,700.

COMMON CORE

Lesson 4:
Date:

Convert numerical expressions into unit form as a mental strategy
for multi-digit multiplication.
7/4/13

engage^ny   2.B.25

Name _____ Date _____

1. Solve using mental math. Draw a tape diagram and fill in the blanks to show your thinking.

a. $49 \times 11 =$ ___49___ elevens 50 elevens

Think: 50 elevens − 1 eleven 49 elevens

$= ($ __50__ $\times 11) - ($ __1__ $\times 11)$

$=$ __550__ $-$ __11__ $=$ __539__

b. $25 \times 13 =$ ___13___ twenty-fives 13 twenty-fives

25 25 25 ○ ○ ○ 25 25 25

Think: __10__ twenty-fives $+$ __3__ twenty-fives

$= ($ __10__ $\times 25) + ($ __3__ $\times 25)$

$=$ __250__ $+$ __75__ $=$ __325__

COMMON CORE

Lesson 4: Convert numerical expressions into unit form as a mental strategy for multi-digit multiplication.

Date: 7/4/13

engage^ny 2.B.26
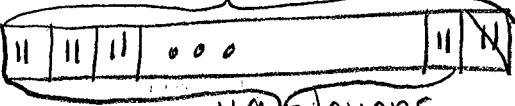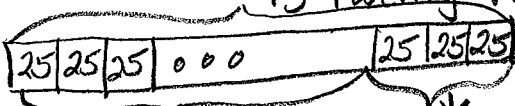
Name _____   Date _____

1. Circle each expression that is not equivalent to the expression in **bold**.

a. **37 × 19**

37 nineteens   (30 × 19) − (7 × 29)   37 × (20 − 1)   (40 − 2) × 19

b. **26 × 35**

35 twenty-sixes   (26 + 30) × (26 + 5)   (26 × 30) + (26 × 5)   35 × (20 + 60)

c. **34 × 89**

34 × (80 + 9)   (34 × 8) + (34 × 9)   34 × (90 − 1)   89 thirty-fours

2. Solve using mental math. Draw a tape diagram and fill in the blanks to show your thinking. The first one was done for you.

a. 19 × 50 = __19__ fifties

50	50	50	...	50	50
1	2	3	...	19	20

Think: 20 fifties − 1 fifties

= (20 × 50) − (1 × 50)

= 1,000 − 50 = 950

b. 11 × 26 = __11__ twenty-sixes

26	26	26	... ...	26	26
1	2	3	...	10	11

Think: 10 twenty-sixes + 1 twenty-sixes

= (10 × 26) + (1 × 26)

= 260 + 26 = 286

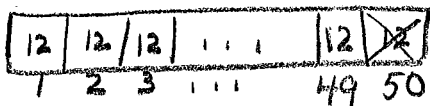COMMON CORE   Lesson 4:   Convert numerical expressions into unit form as a mental strategy
                             for multi-digit multiplication.
                 Date: 7/4/13

engage^ny   2.B.27

c. $49 \times 12 =$ __49__ twelves

Think: __50__ twelves – 1 twelves

$= ($ __50__ $\times 12) - ($ __1__ $\times 12)$

$=$ __600__ $-$ __12__ $=$ __588__

d. $12 \times 25 =$ __12__ seventy-fives
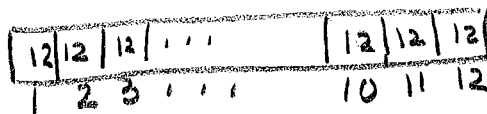
Think: __10__ twenty-fives + __2__ twenty-fives

$= ($ __10__ $\times 25) + ($ __2__ $\times 25)$

$=$ __250__ $+$ __50__ $=$ __300__

3. Define the unit in word form and complete the sequence of problems as was done in Problems 3–4 in the lesson.

a. $29 \times 12 = 29$ __twelves__

Think: 30 __$\times 12$__ – 1 __$\times 12$__

$= 30 \times$ __12__ $- (1 \times$ __12__ $)$

$=$ __360__ $-$ __12__ $=$ __348__

b. $11 \times 31 = 31$ __elevens__

Think: 30 __$\times 11$__ + 1 __$\times 11$__

$= (30 \times$ __11__ $) + (1 \times$ __11__ $)$

$=$ __330__ $+$ __11__ $=$ __319__

c. $19 \times 11 = 19$ __elevens__

Think: 20 __$\times 11$__ – 1 __$\times 11$__

$= (20 \times$ __11__ $) - (1 \times$ __11__ $)$

$=$ __220__ $-$ __11__ $=$ __209__

d. $50 \times 13 = 13$ __fifties__

Think: 10 __$\times 50$__ + 3 __$\times 50$__

$= (10 \times$ __50__ $) + (3 \times$ __50__ $)$

$=$ __500__ $+$ __150__ $=$ __650__

COMMON CORE　|　Lesson 4:　Convert numerical expressions into unit form as a mental strategy for multi-digit multiplication.　　engage^ny　2.B.28

Date:　7/4/13

4. How can 12 × 50 help you find 12 × 49?

12 × 50

| 12 | 12 | 12 | o oo | 12 | 12 |

12 × 49
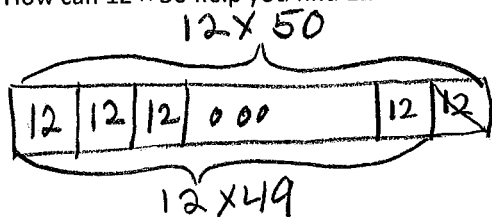
$(50 × 12) - (1 × 12)$
$600 - 12$
588

5. Solve mentally.

a. 16 × 99 = __1,584__

$(100 × 16) - (1 × 16)$
$1600 - 16$

b. 20 × 101 = __2020__

$(100 × 20) + (1 × 20)$
$2000 + 20$

6. Joy is helping her father to build a deck that measures 14 ft by 19 ft. Find the area of the deck using a mental strategy. Explain your thinking.

14 × 19
$(14 × 20) - (14 × 1)$
$280 - 14$
266 ft.^2

Solve 14 × 20 first, then take away 14 ft because it is 14 × 19 and not 20. I did 20 because because it is easier to multiply

7. The Lason School turns 101 years old in June. In order to celebrate, they ask each of the 23 classes to collect 101 items and make a collage. How many total items will be in the collage? Use mental math to solve. Explain your thinking.

101 × 23
$(100 × 23) + (1 × 23)$
$2300 + 23$
2323 items

Multiplying 23 by 100 is easier than vol. so I multiplied 100 by 23 and then added the last 23 to find the total.

Estimate and then multiply.

1	29 x 11 ≈	300	23	801 x 31 ≈	24,000
2	29 x 21 ≈	600	24	803 x 31 ≈	24,000
3	29 x 31 ≈	900	25	703 x 31 ≈	21,000
4	23 x 12 ≈	200	26	43 x 34 ≈	1200
5	23 x 22 ≈	400	27	53 x 34 ≈	1,500
6	23 x 32 ≈	600	28	53 x 31 ≈	1,500
7	23 x 42 ≈	800	29	53 x 51 ≈	2,500
8	37 x 13 ≈	400	30	93 x 31 ≈	2,700
9	37 x 23 ≈	800	31	913 x 31 ≈	27,000
10	36 x 24 ≈	800	32	73 x 31 ≈	2,100
11	24 x 36 ≈	800	33	723 x 31 ≈	21,000
12	43 x 11 ≈	400	34	78 x 34 ≈	2400
13	43 x 21 ≈	800	35	798 x 34 ≈	24,000
14	403 x 21 ≈	8,000	36	62 x 33 ≈	1,800
15	303 x 21 ≈	6,000	37	642 x 33 ≈	18,000
16	203 x 21 ≈	4,000	38	374 x 64 ≈	24,000
17	41 x 11 ≈	400	39	64 x 374 ≈	24,000
18	41 x 21 ≈	800	40	740 x 36 ≈	28,000
19	41 x 31 ≈	1200	41	750 x 36 ≈	32,000
20	401 x 31 ≈	12,000	42	65 x 680 ≈	49,000
21	501 x 31 ≈	15,000	43	849 x 84 ≈	64,000
22	601 x 31 ≈	18,000	44	85 x 849 ≈	72,000

© Bill Davidson

COMMON CORE | Lesson 5: | Connect visual models and the distributive property to partial products of the standard algorithm without renaming.

Date: | 7/4/13

engage^ny   2.B.37

Name _____   Date _____

1. Draw an area model and then solve using the standard algorithm. Use arrows to match the partial products from the area model to the partial products of the algorithm.

    a. 34 × 21

    b. 434 × 21

2. Solve using the standard algorithm.

    a. 431 × 12 = __5,172__

    b. 123 × 23 = __2,829__

    c. 312 × 32 = __9,984__

COMMON CORE | Lesson 5: Connect visual models and the distributive property to partial products of the standard algorithm without renaming.
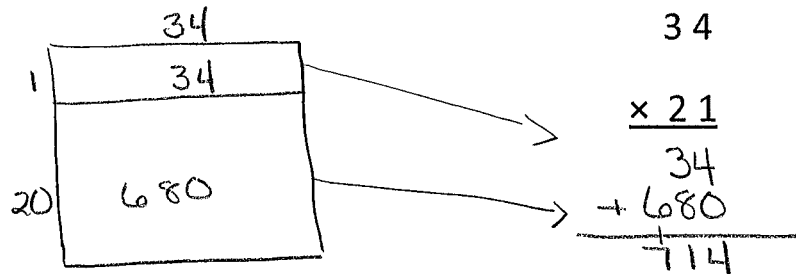Date: 7/4/13

engage^ny   2.B.38

3. Betty saves $161 a month. She saved $141 less each month than Jack. How much will Jack save in 2 years?

Betty $141
$161

Jack ? $302

$161 + $141 = $302

Jack saves $7,248 in 2 years.
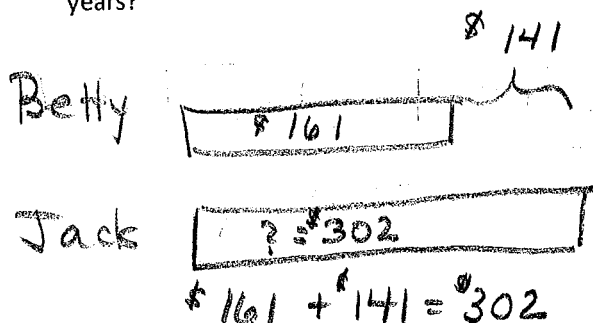
Jack saved $302 per month

1 unit = 302

24 units = 24 × 302 = 7248

$$\begin{array}{r} 302 \\ \times\ 24 \\ \hline 1208 \\ + 6040 \\ \hline 7248 \end{array}$$

4. Farmer Brown feeds 12.1 kg of alfalfa to each of his 2 horses daily. How many kilograms of alfalfa will all his horses have eaten after 21 days? Draw an area model to solve.

24.2

	24.2
1	24.2
20	484
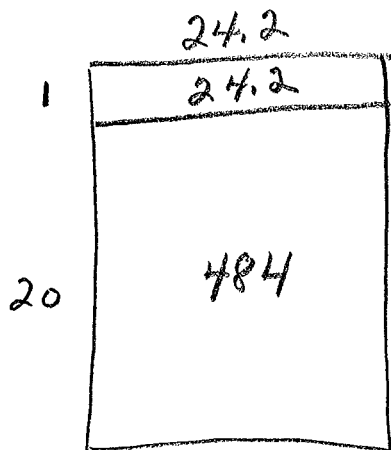
12.1 + 12.1 = 24.2 kg

$$\begin{array}{r} 24.2 \\ \times\ 21 \\ \hline 242 \\ 4840 \\ \hline 508.2 \end{array}$$

1 unit = 24.2 kg
20 units = 484 kg
21 units = 508.2 kg

All the horses will have eaten 508.2 kg of alfalfa in 21 days

Name _____   Date _____

1.   Complete the area model then solve using the standard algorithm.

a.   23 × 31 = _____

$$\begin{array}{r} 23 \\ \times\ 31 \\ \hline 23 \\ +\ 690 \\ \hline 713 \end{array}$$

Area model: top label 23; inside row labeled 1: 23; inside row labeled 30: 690.

b.   143 × 21 = _____

$$\begin{array}{r} 143 \\ \times\ 21 \\ \hline 143 \\ +\ 2860 \\ \hline 3003 \end{array}$$

Area model: top label 143; inside row labeled 1: 143; inside row labeled 20: 286.

Lesson 5:   Connect visual models and the distributive property to partial
Date: products of the standard algorithm without renaming.
                 10/7/13

engage^ny   2.B.40
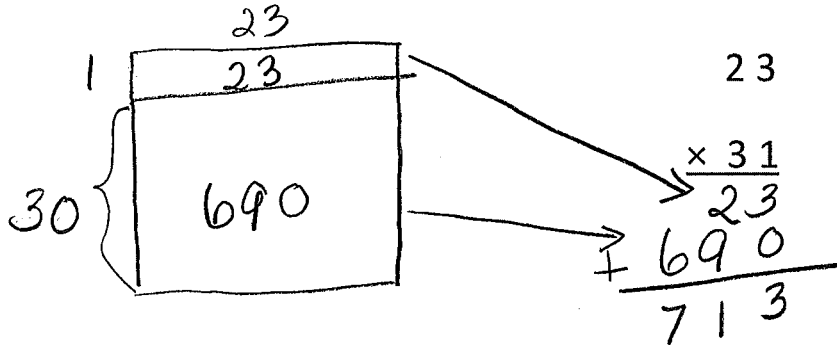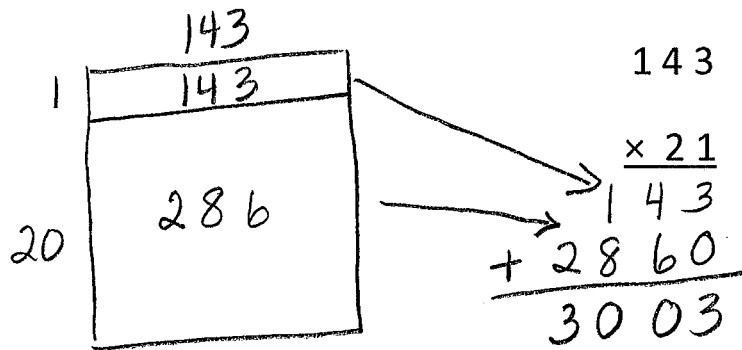
Name _____   Date _____
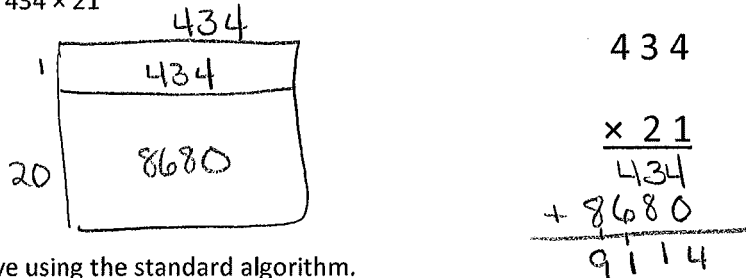
1. Draw an area model then solve using the standard algorithm. Use arrows to match the partial products from the area model to the partial products in the algorithm.

   a. $24 \times 21 =$ _____

   b. $242 \times 21 =$ _____

2. Solve using the standard algorithm.

   a. $314 \times 22 =$ _6,908_

   b. $413 \times 22 =$ _9,086_

   c. $213 \times 32 =$ _____

COMMON CORE | Lesson 5: | Connect visual models and the distributive property to partial products of the standard algorithm without renaming.
| Date: | 7/4/13

engage^{ny}   2.B.41

3. A young snake measures 0.23 m long. During the course of his lifetime, he will grow to be 13 times his
    current length. What will his length be when he's full grown?

        .23
    3 | .69   .69   or   .23
   10 | 2.3   + 2.30   × 13
                     2.99   69
                                         + 230
                                          2.99

He will be 2.99 m when he is full grown.

4. Zenin earns $142 per shift at his new job. During a pay period, he works 12 shifts. What would his pay be
    for that period?

12 shifts

| $142 | $142 | . . . | $142 |

1 shift
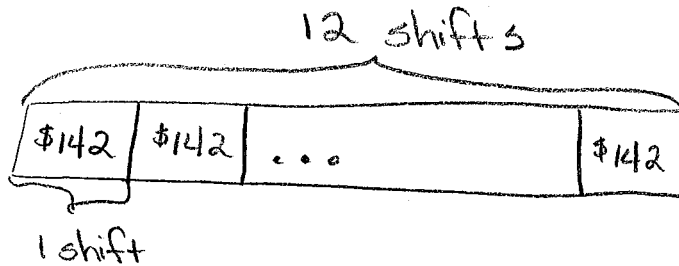
        $142   His pay would be
      × 12 $1,704 for that period.
        284
    + 1420
     $1,704

COMMON CORE

Lesson 5:   Connect visual models and the distributive property to partial
            products of the standard algorithm without renaming.
Date: 7/4/13

engage^ny   2.B.42

Solve.

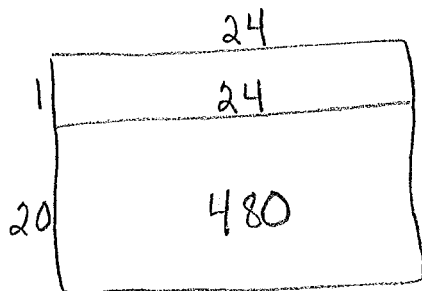|					
1	5 x 100 =	500	23	5000 - 50 =	4950
2	500 - 5 =	495	24	50 x 99 =	4950
3	5 x 99 =	495	25	80 x 100 =	8000
4	3 x 100 =	300	26	80 x 99 =	7920
5	300 - 3 =	297	27	60 x 100 =	6000
6	3 x 99 =	297	28	60 x 99 =	5940
7	2 x 100 =	200	29	11 x 100 =	1100
8	200 - 2 =	198	30	1100 - 11 =	1089
9	2 x 99 =	198	31	11 x 99 =	1089
10	6 x 100 =	600	32	21 x 100 =	2100
11	600 - 6 =	594	33	2100 - 21 =	2079
12	6 x 99 =	594	34	21 x 99 =	2079
13	4 x 100 =	400	35	31 x 100 =	3100
14	4 x 99 =	396	36	31 x 99 =	3069
15	7 x 100 =	700	37	71 x 100 =	7100
16	7 x 99 =	793	38	71 x 99 =	7029
17	9 x 100 =	900	39	42 x 100 =	4200
18	9 x 99 =	891	40	42 x 99 =	4158
19	8 x 100 =	800	41	53 x 99 =	5247
20	8 x 99 =	792	42	64 x 99 =	6336
21	5 x 100 =	500	43	75 x 99 =	7425
22	50 x 100 =	5,000	44	97 x 99 =	9603

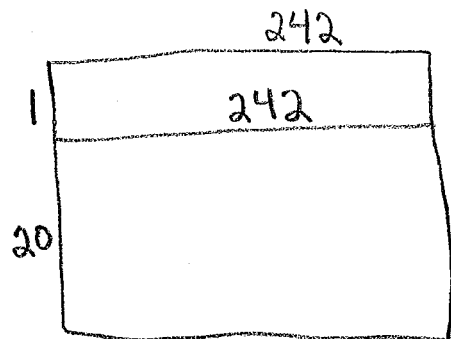© Bill Davidson

Name _____   Date _____

1. Draw an area model, and then solve using the standard algorithm. Use arrows to match the partial products from your area model to the partial products in the algorithm.

a. 48 × 35

$$
\begin{array}{r}
48 \\
\times\ 35 \\
\hline
240 \\
+1440 \\
\hline
1,680
\end{array}
$$

b. 648 × 35
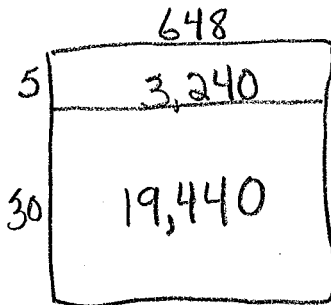
$$
\begin{array}{r}
648 \\
\times\ 35 \\
\hline
3240 \\
19440 \\
\hline
22,680
\end{array}
$$

2. Solve using the standard algorithm.

a. 758 × 92

$$
\begin{array}{r}
758 \\
\times\ 92 \\
\hline
1516 \\
68220 \\
\hline
69,736
\end{array}
$$

c. 476 × 65

$$
\begin{array}{r}
476 \\
65 \\
\hline
2380 \\
28560 \\
\hline
30,940
\end{array}
$$

b. 958 × 94

$$
\begin{array}{r}
958 \\
\times\ 94 \\
\hline
3832 \\
86220 \\
\hline
90,052
\end{array}
$$

d. 547 × 64

$$
\begin{array}{r}
547 \\
\times\ 64 \\
\hline
2188 \\
32820 \\
\hline
35,008
\end{array}
$$

COMMON CORE   Lesson 6:   Connect area diagrams and the distributive property to partial
               Date: products of the standard algorithm without renaming.   engage^ny   2.B.50
                           7/4/13

3. Carpet costs $16 a square foot. A rectangular floor is 14 feet long by 16 feet wide. How much would it cost to carpet the floor?

16 ft.

14 ft.

$A = L \times W$
$= 16 \times 14$
$= 224 \text{ ft.}^2$
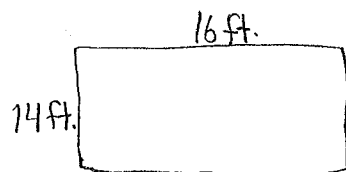
$$\begin{array}{r} 16 \\ \times 14 \\ \hline 64 \\ 160 \\ \hline 224 \end{array}$$

1 unit = $16

224 units = 224 × 16
= $3,584

$$\begin{array}{r} 224 \\ \times 16 \\ \hline 1344 \\ 2240 \\ \hline 3,584 \end{array}$$

4. General admission to The American Museum of Natural History is $19.

   a. If a group of 125 students visits the museum, how much will the group's tickets cost?

   1 unit = $19

   125 units = 125 × 19 = $2,375

   $$\begin{array}{r} 125 \\ \times 19 \\ \hline 1125 \\ 1250 \\ \hline 2,375 \end{array}$$

   The group's tickets will cost $2,375.

   b. If the group also purchases IMAX movie tickets for an additional $4 per student, what is the new total cost of all the tickets? Write an expression that shows how you calculated the new price.

   $(19 + 4) \times 125$
   $= 23 \times 125$
   $= 2,875$

   $$\begin{array}{r} 125 \\ \times 23 \\ \hline 375 \\ + 2500 \\ \hline 2,875 \end{array}$$

   The new total cost of all the tickets will be $2,875.

COMMON CORE | Lesson 6:   Connect area diagrams and the distributive property to partial products of the standard algorithm without renaming.   engage^ny   2.B.51

Date: 7/4/13
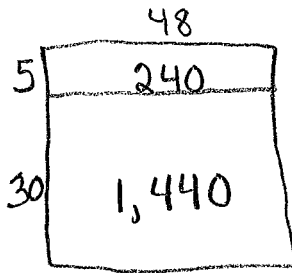
Name _____   Date _____

1. Draw an area model, and then solve using the standard algorithm. Use arrows to match the partial products from your area model to the partial products in the algorithm.

    a.   78 × 42 = _3,276_
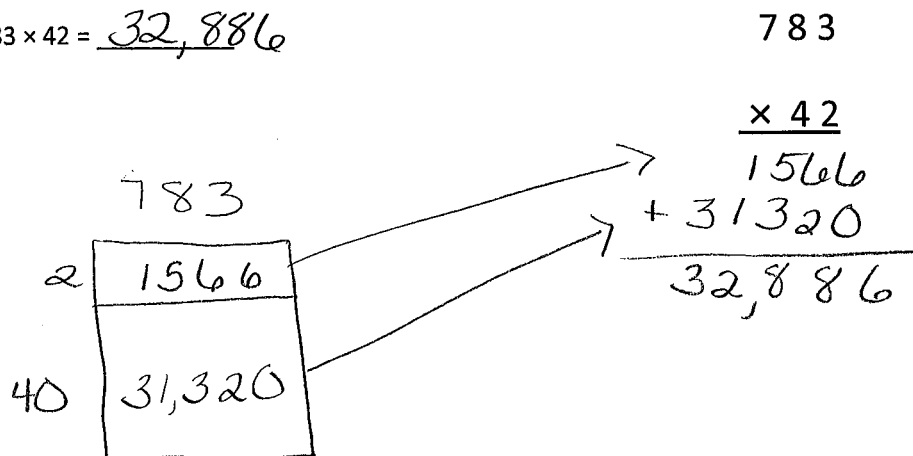
                    78
          2 | 156
         40 | 3120
                                        7 8
                                      × 4 2
                                        1 5 6
                                      + 3 1 2 0
                                      ─────────
                                        3,276

    b.   783 × 42 = _32,886_

                 783
          2 | 1566
         40 | 31,320
                                       7 8 3
                                      × 4 2
                                        1 5 6 6
                                      + 3 1 3 2 0
                                      ───────────
                                        32,886

COMMON CORE | Lesson 6:   Connect area diagrams and the distributive property to partial
              | products of the standard algorithm without renaming.   engage^ny   2.B.52
              | Date: 7/4/13

Name _____   Date _____

1. Draw an area model, and then solve using the standard algorithm. Use arrows to match the partial products from your area model to the partial products in the algorithm.

   a. $27 \times 36 =$ _____

   27

	27
6	162
+	
30	810

   ```
       2 7
     × 3 6
     1 6 2
   + 8 1 0
     9 7 2
   ```

   b. $527 \times 36 =$ _____

   527

	527
6	3162
+	
30	15,810

   ```
        5 2 7
      ×   3 6
      3 1 6 2
   + 1 5 8 1 0
     1 8,9 7 2
   ```

2. Solve using the standard algorithm.

   a. 649×53

   ```
        6 4 9
      ×   5 3
      1 9 4 7
    3 2 4 5 0
    3 4,3 9 7
   ```

   c. 758×46

   ```
        7 5 8
      ×   4 6
      4 5 4 8
    3 0 3 2 0
    3 4 8 6 8
   ```

   b. 496×53

   ```
        4 9 6
      ×   5 3
      1 4 8 8
    2 4 8 0 0
    2 6 2 8 8
   ```

   d. 529×48

   ```
        5 2 9
      ×   4 8
      4 2 3 2
    2 1 1 6 0
    2 5,3 9 2
   ```

3. Each of the 25 students in Mr. McDonald's class sold 16 raffle tickets. If each ticket cost $15, how much money did Mr. McDonald's students raise?

$1 \text{ unit} = \$15$

$(\$15 \times 16) \times 25$

$\$240 \times 25$

$$\begin{array}{r} \$15 \\ \times\ 16 \\ \hline 90 \\ +\ 150 \\ \hline \$240 \end{array}$$

$$\begin{array}{r} \$240 \\ \times\ 25 \\ \hline 1200 \\ +\ 4800 \\ \hline \$6000 \end{array}$$

His students raised $6000

4. Jayson buys a car and pays by installments. Each installment is $567 per month. After 48 months, Jayson owes $1250. What was the total price of the vehicle?

$\$567 \times 48 = \$27,216$

$\$27,216 + \$1250 = \$28,466$

The total cost of the car was $28,466.

$$\begin{array}{r} 567 \\ +\ \times\ 48 \\ \hline 4536 \\ +\ 22680 \\ \hline \$27,216 \end{array}$$

$$\begin{array}{r} \$27,216 \\ +\ \$\ 1,250 \\ \hline \$28,466 \end{array}$$

COMMON CORE | Lesson 6: | Connect area diagrams and the distributive property to partial products of the standard algorithm without renaming.
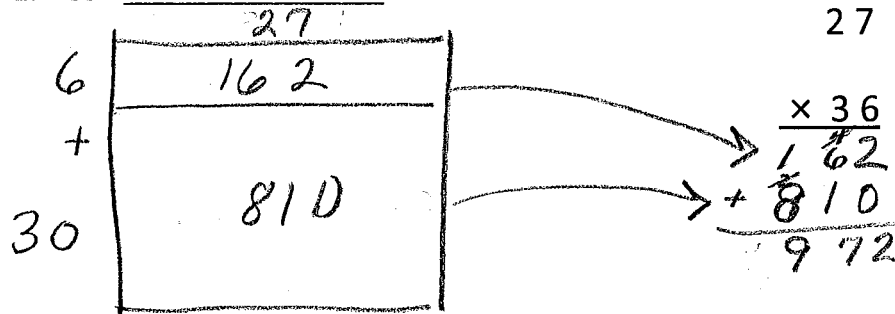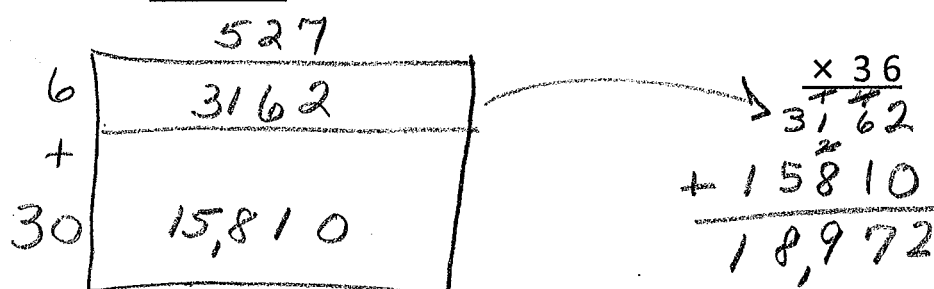
Date: | 7/4/13

engage^{ny} 2.B.54

A

Correct _____

Multiply.

1	2 x 10 =	20	23	33 x 20 =	660
2	12 x 10 =	120	24	33 x 200 =	6600
3	12 x 100 =	1,200	25	24 x 10 =	240
4	4 x 10 =	40	26	24 x 20 =	480
5	34 x 10 =	340	27	24 x 100 =	2400
6	34 x 100 =	3400	28	24 x 200 =	4800
7	7 x 10 =	70	29	23 x 30 =	690
8	27 x 10 =	270	30	23 x 300 =	6900
9	27 x 100 =	2700	31	71 x 2 =	142
10	3 x 10 =	30	32	71 x 20 =	1420
11	3 x 2 =	6	33	14 x 2 =	28
12	3 x 20 =	60	34	14 x 3 =	42
13	13 x 10 =	130	35	14 x 30 =	420
14	13 x 2 =	26	36	14 x 300 =	4200
15	13 x 20 =	260	37	82 x 20 =	1640
16	13 x 100 =	1,300	38	15 x 300 =	4500
17	13 x 200 =	2,600	39	71 x 600 =	42600
18	2 x 4 =	8	40	18 x 40 =	720
19	22 x 4 =	88	41	75 x 30 =	2250
20	22 x 40 =	880	42	84 x 300 =	25200
21	22 x 400 =	8800	43	87 x 60 =	5220
22	33 x 2 =	66	44	79 x 800 =	63200

© Bill Davidson

B

Improvement _____   # Correct _____

Multiply.

1	3 x 10 =	30	23	44 x 20 =	880
2	13 x 10 =	130	24	44 x 200 =	8,800
3	13 x 100 =	1,300	25	42 x 10 =	420
4	5 x 10 =	50	26	42 x 20 =	840
5	35 x 10 =	350	27	42 x 100 =	4,200
6	35 x 100 =	3,500	28	42 x 200 =	8,400
7	8 x 10 =	80	29	32 x 30 =	960
8	28 x 10 =	280	30	32 x 300 =	9,600
9	28 x 100 =	2800	31	81 x 2 =	162
10	4 x 10 =	40	32	81 x 20 =	1,620
11	4 x 2 =	8	33	13 x 3 =	39
12	4 x 20 =	80	34	13 x 4 =	52
13	14 x 10 =	140	35	13 x 40 =	520
14	14 x 2 =	28	36	13 x 400 =	5,200
15	14 x 20 =	280	37	72 x 30 =	2,160
16	14 x 100 =	1,400	38	15 x 300 =	4,500
17	14 x 200 =	2,800	39	81 x 600 =	48,600
18	2 x 3 =	6	40	16 x 40 =	640
19	22 x 3 =	66	41	65 x 30 =	1,950
20	22 x 30 =	660	42	48 x 300 =	14,400
21	22 x 300 =	6,600	43	89 x 60 =	5,340
22	44 x 2 =	88	44	76 x 800 =	60,800

© Bill Davidson

COMMON CORE | Lesson 7:   Connect area diagrams and the distributive property to partial products of the standard algorithm with renaming.   engage^ny   2.B.62
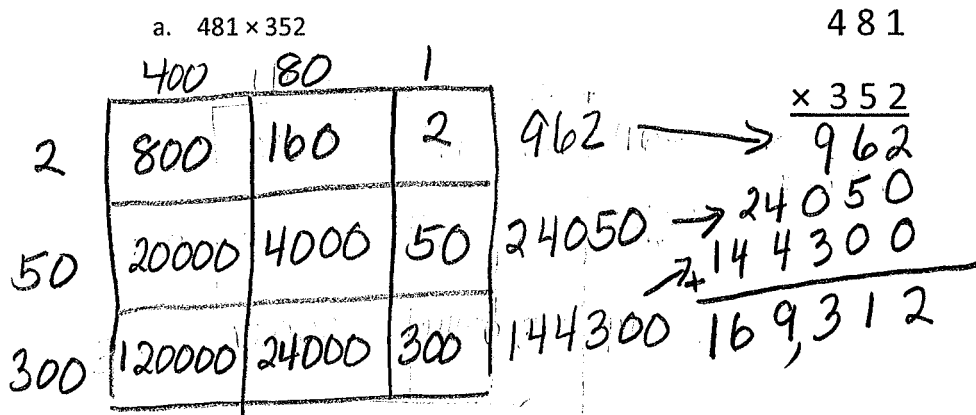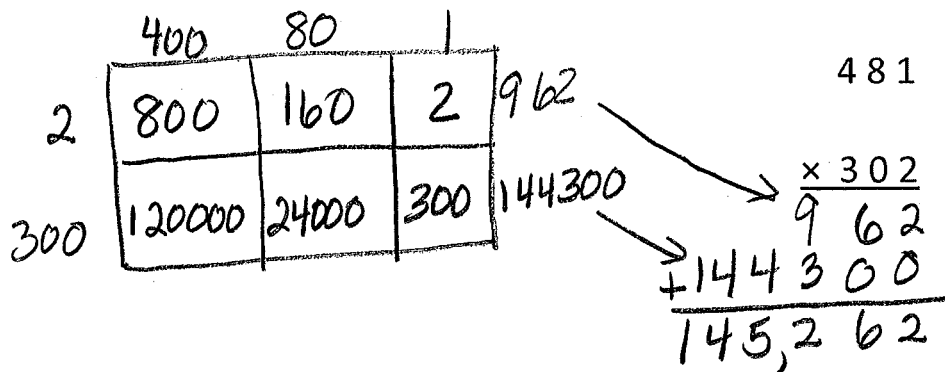
Date: 7/4/13

Name _____   Date _____

1. Draw an area model, and then solve using the standard algorithm. Use arrows to match the partial products from the area model to the partial products in the algorithm.

   a. 481 × 352

	400	80	1
2	800	160	2
50	20000	4000	50
300	120000	24000	300

   $$962 \longrightarrow$$
   $$24050 \longrightarrow$$
   $$144300$$

   ```
       4 8 1
   ×   3 5 2
   ─────────
       9 6 2
     2 4 0 5 0
   + 1 4 4 3 0 0
   ─────────────
   1 6 9, 3 1 2
   ```

   b. 481 × 302

	400	80	1
2	800	160	2
300	120000	24000	300

   $$962$$
   $$144300$$

   ```
       4 8 1
   ×   3 0 2
   ─────────
       9 6 2
   + 1 4 4 3 0 0
   ─────────────
   1 4 5, 2 6 2
   ```

   c. Both 1(a) and 1(b) have three-digit multipliers. Why are there three partial products in 1(a) and only two partial products in 1(b)?

   I 1(b) you have no tens place so we don't have a section in the rectangle for tens. The whole value can be shown with just hundreds and ones.
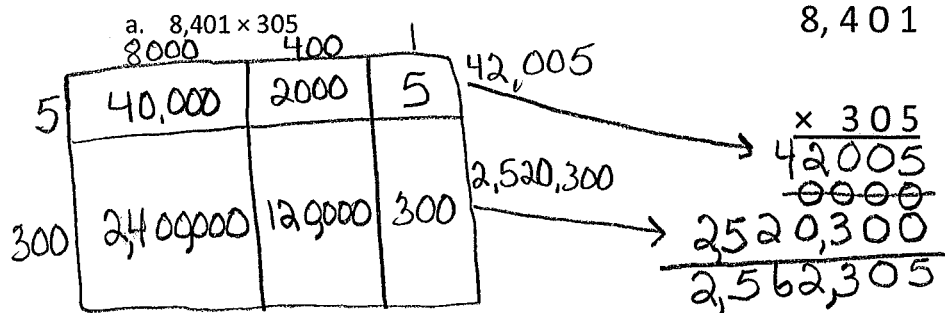
COMMON CORE

Lesson 7: Connect area diagrams and the distributive property to partial products of the standard algorithm with renaming.

Date: 7/4/13

engage^ny   2.B.63

2. Solve by drawing the area model and using the standard algorithm.

a. $8,401 \times 305$

$$8,401$$
$$\times\ 305$$
$$42005$$
$$0000$$
$$2520300$$
$$2,562,305$$

b. $7,481 \times 350$

$$7,481$$
$$\times\ 350$$
$$374050$$
$$2244300$$
$$2,618,350$$

3. Solve using the standard algorithm.

a. 346×27

$$346$$
$$\times\ 27$$
$$2422$$
$$+\ 6920$$
$$9,342$$

c. 346×207

$$346$$
$$\times\ 207$$
$$2422$$
$$+\ 69200$$
$$71,622$$

b. $1,346 \times 297$

$$1346$$
$$\times\ 297$$
$$9422$$
$$121140$$
$$+\ 269200$$
$$399,762$$

d. $1,346 \times 207$

$$1,346$$
$$\times\ 207$$
$$9422$$
$$269200$$
$$278,622$$

COMMON CORE | Lesson 7: | Connect area diagrams and the distributive property to partial products of the standard algorithm with renaming.
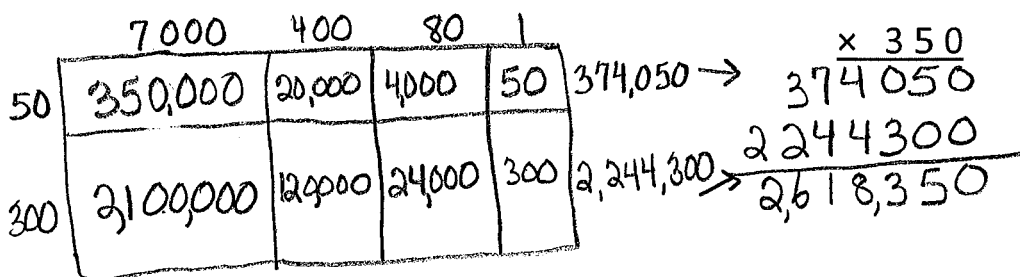Date: | 7/4/13

engage^ny   2.B.64

4. A school district purchased 615 new laptops for their mobile labs. Each computer cost $409. What's the total cost for all of the laptops?

$$
\begin{array}{r}
615 \\
\times \;\$409 \\
\hline
5535 \\
+246000 \\
\hline
251,535
\end{array}
$$

The laptops cost $251,535

5. A publisher prints 1,512 copies of a book in each print run. If they print 305 runs, how many books will be printed?

$$
\begin{array}{r}
1512 \\
\times 305 \\
\hline
7560 \\
+453600 \\
\hline
461,160
\end{array}
$$

	1000	500	10	2	
5	5000	2500	50	10	7560
300	300,000	150,000	3000	600	453,600

461,160 books will be printed.

6. As of the 2010 census, there were 3,669 people living in Marlboro, New York. Brooklyn, New York, has 681 times as many people. How many more people live in Brooklyn than in Marlboro?

$$
\begin{array}{r}
3669 \\
\times 681 \\
\hline
3669 \\
293520 \\
+2201400 \\
\hline
2498,589
\end{array}
$$

$$
\begin{array}{r}
2,498,589 \\
-\quad 3,669 \\
\hline
2,494,920
\end{array}
$$

2,494,920 more people

COMMON CORE | Lesson 7: | Connect area diagrams and the distributive property to partial products of the standard algorithm with renaming. | engage^ny | 2.B.65
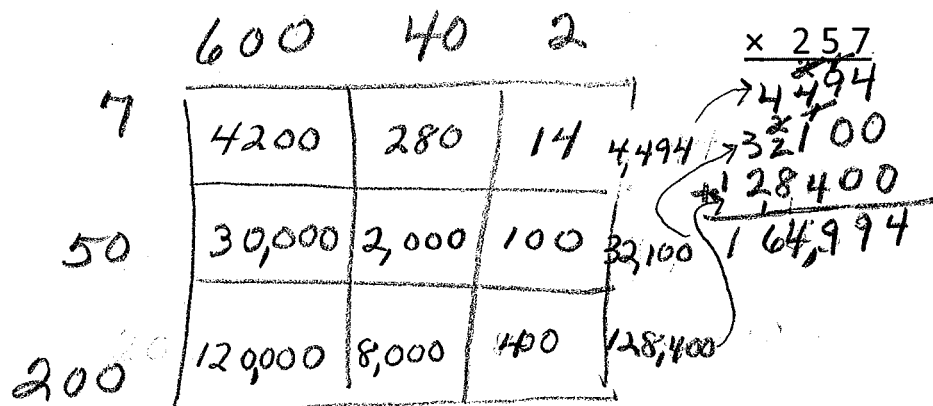| Date: | 7/4/13
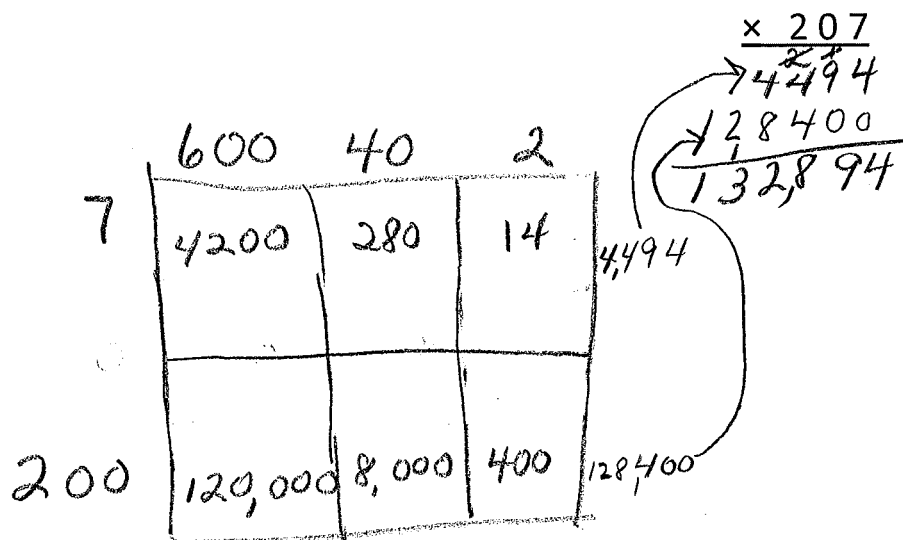
© 2013 Common Core, Inc. Some rights reserved. commoncore.org

(cc) BY-NC-SA This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

Name _____   Date _____

1. Draw an area model, and then solve using the standard algorithm.

a.   642 × 257 = _164,994_   6 4 2

$$600 \qquad 40 \qquad 2$$

	600	40	2	
7	4200	280	14	4,494
50	30,000	2,000	100	32,100
200	120,000	8,000	400	128,400

```
    6 4 2
  ×  2 5 7
    4 4 9 4
  3 2 1 0 0
1 2 8 4 0 0
1 6 4 9 9 4
```

b.   642 × 207 = _132,894_   6 4 2

$$600 \qquad 40 \qquad 2$$

	600	40	2	
7	4200	280	14	4,494
200	120,000	8,000	400	128,400

```
    6 4 2
  ×  2 0 7
    4 4 9 4
1 2 8 4 0 0
1 3 2 8 9 4
```
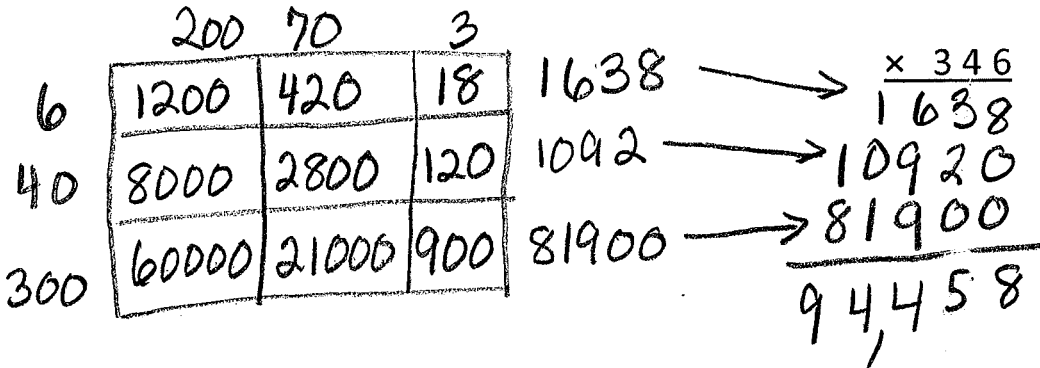
Name _____   Date _____

1. Draw an area model, and then solve using the standard algorithm. Use arrows to match the partial products from your area model to the partial products in your algorithm.
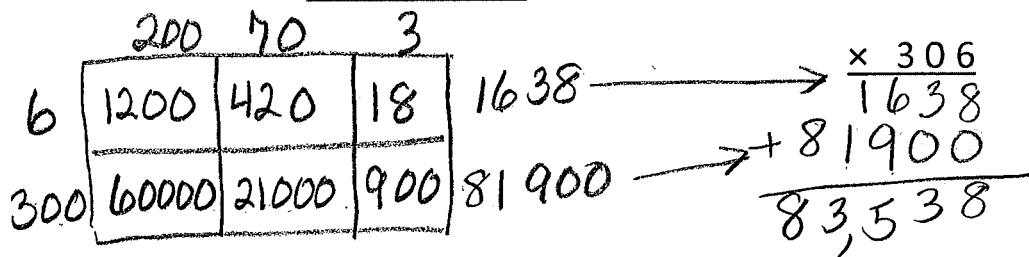
a. 273 × 346 = _____

```
        200    70     3
   ┌──────┬──────┬──────┐
 6 │ 1200 │ 420  │  18  │   1638  ──────→
   ├──────┼──────┼──────┤
40 │ 8000 │ 2800 │ 120  │   1092  ──────→
   ├──────┼──────┼──────┤
300│ 60000│21000 │ 900  │  81900  ──────→
   └──────┴──────┴──────┘
```

```
      2 7 3
   ×  3 4 6
   ─────────
    1 6 3 8
   1 0 9 2 0
   8 1 9 0 0
   ─────────
   9 4,4 5 8
```

b. 273 × 306 = _____

```
        200    70     3
   ┌──────┬──────┬──────┐
 6 │ 1200 │ 420  │  18  │   1638  ──────→
   ├──────┼──────┼──────┤
300│ 60000│21000 │ 900  │  81900  ──────→
   └──────┴──────┴──────┘
```

```
      2 7 3
   ×  3 0 6
   ─────────
    1 6 3 8
 + 8 1 9 0 0
   ─────────
   8 3,5 3 8
```
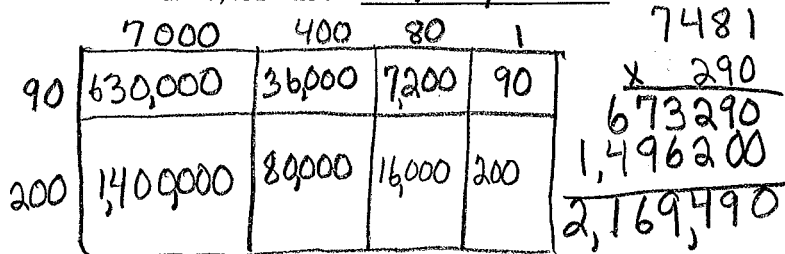
c. Both Parts (a) and (b) have three-digit multipliers. Why are there three partial products in (a) and only two partial products in (b)?
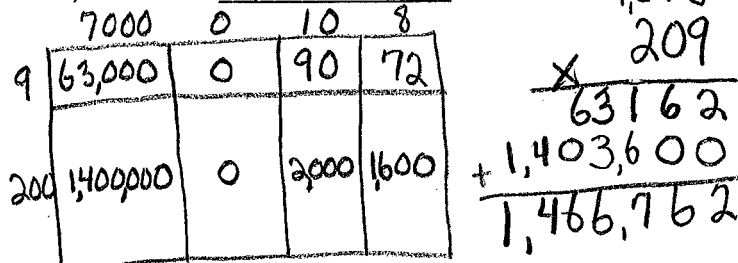
Part a has a three partial products because you have a digit in the ones, tens, and hundreds place. Part b only has two partial products because you have digits in the ones and hundreds place but not the tens place.

COMMON CORE | Lesson 7: Connect area diagrams and the distributive property to partial products of the standard algorithm with renaming.   engage^{ny}   2.B.67

Date: 7/4/13

2. Solve by drawing the area model and using the standard algorithm.

a. $7{,}481 \times 290 = $ _2,169,490_

	7000	400	80	1
90	630,000	36,000	7,200	90
200	1,409000	80,000	16,000	200

```
    7481
  x  290
  673290
 1,496200
 2,169,790
```

b. $7{,}018 \times 209 = $ _1,466,762_

	7000	0	10	8
9	63,000	0	90	72
200	1,400000	0	2000	1600

```
    7,018
  x   209
    63162
+ 1,403,600
  1,466,762
```

3. Solve using the standard algorithm.

a. 426×357
```
     426
   x 357
    2982
   21300
  127800
  152,082
```

c. 426×307
```
     426
   x 307
    2982
  127800
  130,182
```

b. $1{,}426 \times 357$
```
    1,426
   x  357
    9982
   71300
  427800
  509,082
```

d. $1{,}426 \times 307$
```
    1426
   x 307
    9982
  427800
  437,782
```

4. The Hudson Valley Renegades Stadium holds a maximum of 4,505 people. During the heights of their popularity, they sold out 219 consecutive games. How many tickets were sold during this time?

```
    4,505
   x  219
   40545
   45050
  901000
  986,595
```

986,595 tickets

5. At the farmer's market, each of the 94 vendors makes $502 in profit each ~~weekend~~. Saturday How much profit will all vendors make on Saturday?

```
   $502
   x 94
   2008
 + 45180
  $47,188
```

The profit for all vendors will be #47,188.

■ COMMON CORE

Lesson 7:   Connect area diagrams and the distributive property to partial products of the standard algorithm with renaming.

Date: 7/4/13

engage^ny   2.B.68

Name _____   Date _____

1. Estimate the product first. Solve by using the standard algorithm. Use your estimate to check the reasonableness of the product.

a. 213 × 328	b. 662 × 372	c. 739 × 442
≈ 200 × 300 = 60,000 213 × 328 1784 4260 63,900 69,864	≈ 700 × 400 = 280,000 662 × 372 1324 46340 + 198,600 246,264	≈ 700 × 400 = 280,000 739 × 442 1478 29560 295,600 326,638
d. 807 × 491	e. 3,502 × 656	f. 4,390 × 741
≈ 800 × 500 = 400,000 807 × 491 807 72630 +322800 396,237	≈ 4000 × 700 = 2,800,000 3502 × 656 21012 175,100 2,101,200 2,297,312	≈ 4,000 × 700 = 2,800,000 4390 × 741 4390 175600 3,073,000 3,252,990
g. 530 × 2,075	h. 4,004 × 603	i. 987 × 3,105
≈ 500 × 2,000 = 1,000,000 2075 × 530 0 000 62 250 +1037500 1,099,750	≈ 4000 × 600 = 2,400,000 4004 × 603 12012 0 000 2402400 2,414,412	≈ 1,000 × 3,000 = 3,000,000 3,105 × 987 21 735 248 400 2,794,500 3,064,635

COMMON CORE

Lesson 8:   Fluently multiply multi-digit whole numbers using the standard algorithm and using estimation to check for reasonableness of the products.
Date: 7/4/13

engage^ny   2.B.75

© 2013 Common Core, Inc. Some rights reserved. commoncore.org

(cc) BY-NC-SA   This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

2. Each container holds 1 L 275 mL of water. How much water is in 609 identical containers? Find the difference between your estimated product and precise product.

1 L 275 mL = 1275 mL

Estimate: 1200 × 600
720,000 mL
720 L

Actual: 1275 × 609

$$\begin{array}{r} {}^{4\;3}1275 \\ \times\ 609 \\ \hline 11475 \\ +765000 \\ \hline 776475 \end{array}$$

= 776,475 mL
= 776 L 475 mL

776 L 475 mL
− 720 L 0 mL
──────────
56 L 475 mL

The actual is 56 L 475 mL larger than the estimate

3. A club had some money to purchase new chairs. After buying 355 chairs at $199 each, there was $1,068 remaining. How much money did the club have at first?

1 chair = 1 unit
1 unit = $199

$199 × 355

$$\begin{array}{r} \$199 \\ \times\ 355 \\ \hline 995 \\ 9950 \\ +59700 \\ \hline \$70,645 \end{array}$$

$$\begin{array}{r} \$70,645 \\ +\ \$1,068 \\ \hline \$71,713 \end{array}$$

The club had $71,713 before purchasing new chairs.

4. So far, Carmella has collected 14 boxes of baseball cards. Each box has 315 cards in it. Carmella estimates that she has about 3,000 cards, so she buys 6 albums that hold 500 cards each.

a. Will the albums have enough space for all of her cards? Why or why not?

No, she will not have enough room. She probably rounded both the number of box and the number of cards down. getting 10 × 300 = 3000. This makes her estimate too small.

b. How many cards does Carmella have?

$$\begin{array}{r} 315 \\ \times\ 14 \\ \hline 1260 \\ +3150 \\ \hline 4410 \end{array}$$

Carmella has 4,410 cards

c. How many albums will she need for all of her baseball cards?

Skip counting: 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500

or

≈ 4500 ÷ 500

She will need 9 albums

COMMON CORE

Lesson 8:

Date: 7/4/13

Fluently multiply multi-digit whole numbers using the standard algorithm and using estimation to check for reasonableness of the products.

engage^ny   2.B.76

Name _____   Date _____

1. Estimate the product first. Solve by using the standard algorithm. Use your estimate to check the reasonableness of the product.

   a. $283 \times 416 =$ _120,000_

   $\approx \underline{300} \times \underline{400}$

   $= \underline{120000}$

   $$
   \begin{array}{r}
   283 \\
   \times \ 416 \\
   \hline
   1698 \\
   2830 \\
   113200 \\
   \hline
   117,728
   \end{array}
   $$

   b. $2{,}803 \times 406 =$ _1,200,000_

   $\approx \underline{3{,}000} \times \underline{400}$

   $= \underline{1200000}$

   $$
   \begin{array}{r}
   2803 \\
   \times \ 406 \\
   \hline
   16818 \\
   1121200 \\
   \hline
   1{,}138{,}018
   \end{array}
   $$

Name _____ Date _____

1. Estimate the product first. Solve by using the standard algorithm. Use your estimate to check the reasonableness of the product.

a. 312 × 149	b. 743 × 295	c. 428 × 637
≈ 300 × 100 = 30,000 3 1 2 × 1 4 9 2 8 0 8 1 2 4 8 0 + 3 1 2 0 0 4 6,4 8 8	= 700 × 300 = 210,000 7 4 3 × 2 9 5 3 7 1 5 6 6 8 7 0 + 1 4 8 6 0 0 2 1 9,1 8 5	= 400 × 600 = 240006 4 2 8 × 6 3 7 2 9 9 6 1 2 8 4 0 + 2 5 6 8 0 0 2 7 2,6 3 6
d. 691 × 305	e. 4,208 × 606	f. 3,068 × 523
= 700 × 300 = 210000 6 9 1 × 3 0 5 3 4 5 5 2 0 7 3 0 0 2 1 0,7 5 5	= 4,000 × 600 = 2,400,000 4 2 0 8 × 6 0 6 2 5 2 4 8 2 5 2 4 8 0 0 2,5 5 0,0 4 8	= 3,000 × 500 = 1500,000 3 0 6 8 × 5 2 3 9 2 0 4 6 1 3 6 0 1 5 3 4 0 0 0 1,6 0 4,5 6 4
g. 430 × 3,064	h. 3,007 × 502	i. 254 × 6,104
= 400 × 3,000 = 1,200,000 3 0 6 4 × 4 3 0 9 1 9 2 0 1 2 2 5 6 0 0 1,3 1 7,5 2 0	= 3,000 × 500 = 1,500,000 3 0 0 7 × 5 0 2 6 0 1 4 1 5 0 3 5 0 0 1,5 0 9,5 1 4	= 300 × 6,000 = 1,800,000 6 1 0 4 × 2 5 4 2 4 4 1 6 3 0 5 2 0 0 1 2 2 0 8 0 0 1,5 5 0,4 1 6

Lesson 8: Fluently multiply multi-digit whole numbers using the standard algorithm and using estimation to check for reasonableness of the products.

Date: 7/4/13

engage^{ny}

2.B.78

2. When multiplying 1,729 times 308, Clayton got a product of 53,253. Without calculating, does his product seem reasonable? Explain your thinking.

No, his product is not reasonable because a factor in the 1000's times a factor in the 100's will give you a product in the 100,000's.

3. A publisher prints 1,912 copies of a book in each print run. If they print 305 runs, the manager wants to know about how many books will be printed. What's a reasonable estimate?

$$\begin{array}{r} 2000 \\ \times\ 300 \\ \hline 600,000 \end{array}$$
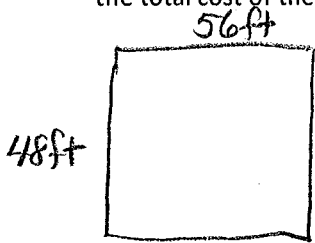
600,000 copies is a reasonable estimate.

Name _____   Date _____

Solve.

1. An office space in New York City measures 48 feet by 56 feet. If it sells for $565 per square foot, what is the total cost of the office space?

56 ft

48 ft

$A = l \times w$
$= 48 \times 56$

$\begin{array}{r} 56 \\ \times 48 \\ \hline 448 \\ +2240 \\ \hline 2688 \text{ sq. ft.} \end{array}$

$\begin{array}{r} 2688 \\ \times 565 \\ \hline 13440 \\ 161280 \\ 1344000 \\ \hline 1518720 \end{array}$

The office space costs $1,518,720

2. Gemma and Leah are both jewelry makers. Gemma made 106 beaded necklaces. Leah made 39 more necklaces than Gemma.

a. Each necklace they make has exactly 104 beads on it. How many beads did both girls use altogether while making their necklaces?

Gemma [106]
Leah [? = 145]
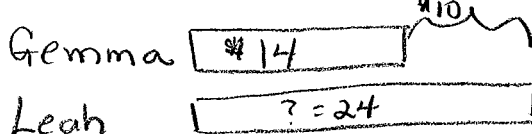39

$\times 104$
$\times 104$
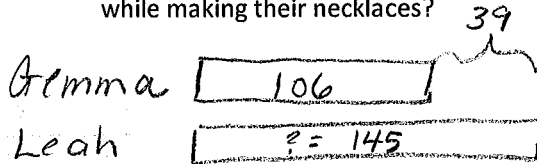
The girls used 26,104 beads

$\begin{array}{r} 106 \\ \times 104 \\ \hline 424 \\ 10600 \\ \hline 11024 \end{array}$

$\begin{array}{r} 145 \\ \times 104 \\ \hline 580 \\ 14500 \\ \hline 15080 \end{array}$

11,024
15080
26,104

b. At a recent craft fair, Gemma sold each of her necklaces for $14. Leah sold each of her necklaces for 10 dollars more. Who made more money at the craft fair? How much more?

Gemma [$14]
Leah [? = 24]

G 106
$\times 14$
424
1060
1,484

L 145
$\times 24$
580
2900
$3,480

$3480
- 1484
$1996

Leah made $1,996 more

3. Peng bought 26 treadmills for her new fitness center at $1,334 each. Then she bought 19 stationary bikes for $749 each. How much did she spend on her new equipment? Write an expression, and then solve.

$1,334 × 26

$749 × 19

$\begin{array}{r} 1334 \\ \times 26 \\ \hline 8004 \\ 26680 \\ \hline 34684 \end{array}$

$\begin{array}{r} 749 \\ \times 19 \\ \hline 6741 \\ +7490 \\ \hline 14231 \end{array}$

34,684
+ 14,231
48,915

Peng spent $48,915

COMMON CORE   Lesson 9:   Fluently multiply multi-digit whole numbers using the standard algorithm to solve multi-step word problems.

Date: 7/4/13

engage^ny   2.B.85

4. A Hudson Valley farmer has 26 employees. He pays each employee $410 per week. After paying his workers for one week, the farmer has $162 left in his bank account. How much money did he have at to begin with?
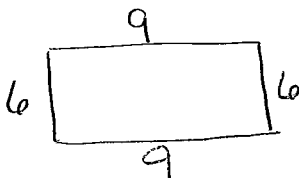
farmer's $ | $410×26 | $162 |
?
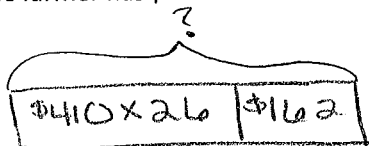
$410
× 26
2460
+ 8200
$10,660

$10,660
+ $162
$10,822

The farmer began with $10,822.

5. Frances is sewing a border around 2 rectangular tablecloths that each measure 9 feet long by 6 feet wide. If it takes her 3 minutes to sew on 1 inch of border, how many minutes will it take her to complete her sewing project? Write an expression, and then solve.

$$2 \times (9' + 9' + 6' + 6) \times 12 \text{ in} \times 3 \text{ min}$$
$$2 \times (18 \text{ ft} + 12 \text{ ft}) \times 12 \text{ in} \times 3 \text{ min}$$
$$2 \times 30 \text{ ft} \times 12 \text{ in} \times 3 \text{ min}$$
$$60 \text{ ft} \times 12 \text{ in} \times 3 \text{ min}$$
$$720 \text{ in} \times 3 \text{ min}$$
$$2160 \text{ minutes}$$

6. Each grade level at Hooperville Schools has 298 students.
   a. If there are 13 grade levels, how many students attend Hooperville Schools?

298
× 13
894
+ 2980
3874

3,874 students attend Hooperville Schools

   b. A nearby district, Willington, is much larger. They have 12 times as many students. How many students attend schools in Willington?

3,874
× 12
7748
+ 38740
46,488

46,488 students attend Willington schools

Name _____   Date _____

Solve.

1. Juwad picked 30 bags of apples on Monday and sold them at his fruit stand for $3.45 each. The following week he picked and sold 6 bags more.

    a. How much money did Juwad earn in the first week?

    3.45×30

    $\begin{array}{r} 3.45 \\ \times\ 30 \\ \hline \$103.50 \end{array}$ $\$103.50$

    b. How much money did he earn in the second week?

    3.45×36

    $\begin{array}{r} 3.45 \\ \times\ 36 \\ \hline 2070 \\ 10350 \\ \hline 124.20 \end{array}$ $\$124.20$

    c. How much did Juwad earn selling bags of apples these two weeks?

    $\begin{array}{r} 103.50 \\ +\ 124.20 \\ \hline 227.70 \end{array}$ $\$227.70$

    d. (Bonus) Each bag Juwad picked holds 15 apples. How many apples did he pick in two weeks? Write an expression to represent this statement.

    $(30 + 36) \times 15$

Name _____   Date _____

Solve.

1. Jeffery bought 203 sheets of stickers. Each sheet has a dozen stickers. He gave away 907 stickers to his family and friends on Valentine's Day. How many stickers does Jeffery have remaining?

$$
\begin{array}{r}
203 \\
\times\ 12 \\
\hline
406 \\
+2030 \\
\hline
2,436
\end{array}
\qquad
\begin{array}{r}
2,436 \\
-\ 907 \\
\hline
1,529
\end{array}
$$

Jeffery has 1,529 stickers remaining.

2. During the 2011 season, a quarterback passed for 302 yards per game. He played in all 16 regular season games that year.

a. How many total yards did the quarterback pass for?

$$
\begin{array}{r}
302 \\
\times\ 16 \\
\hline
1812 \\
3020 \\
\hline
4832
\end{array}
$$

Quarterback passed for a total of 4,832 yards.

b. If he matches this passing total for each of the next 13 seasons, how many yards will he pass for in his career?

$$
\begin{array}{r}
4,832 \\
\times\ 13 \\
\hline
14496 \\
+48320 \\
\hline
62816
\end{array}
$$

He will pass for 62,816 yards in his career.

3. Bao saved $179 a month. He saved $145 less than Ada each month. How much would Ada save in three and a half years?

$$
\begin{array}{r}
179 \\
+145 \\
\hline
\$324/mon.
\end{array}
\quad
\begin{array}{r}
\$324 \\
\times\ 12 \\
\hline
648 \\
3240 \\
\hline
\$3888/yr.
\end{array}
\quad
\begin{array}{r}
324 \\
\times\ 6 \\
\hline
1,944/\tfrac{1}{2}yr.
\end{array}
\quad
\begin{array}{r}
3888 \\
\times\ 3 \\
\hline
11,664/3yr.
\end{array}
\quad
\begin{array}{r}
11,664 \\
+1,944 \\
\hline
13,608
\end{array}
$$

Ada will save $13,608 in 3½ years!

COMMON CORE | Lesson 9:   Fluently multiply multi-digit whole numbers using the standard algorithm to solve multi-step word problems.
| Date: 7/4/13

engage^ny   2.B.88

4. Mrs. Williams is knitting a blanket for her newborn granddaughter. The blanket is 2.25 meters long and 1.8 meters wide. What is the area of the blanket? Write the answer in centimeters.

$2.25m \times 100 = 225cm$

$1.8m \times 100 = 180cm$

$A = l \times w$

$$\begin{array}{r} 225 \\ \times 180 \\ \hline 18\,000 \\ + 22\,500 \\ \hline 40,500 \end{array}$$

The area of the blanket is 40,500 square cm

5. Use the chart to solve.

Soccer Field Dimensions

	FIFA Regulation (in yards)	New York State High Schools (in yards)
Minimum Length	110	100
Maximum Length	120	120
Minimum Width	70	55
Maximum Width	80	80

a. Write an expression to find the difference in the maximum area and minimum area of a NYS high school soccer field. Then evaluate your expression.

Max. $120 \times 80 = 9,600$ sq yds

Min. $100 \times 55 = 5500$ sq. yds

$A = l \times w$

$$\begin{array}{r} 120 \\ \times 80 \\ \hline 9,600 \end{array}$$

$$\begin{array}{r} 9600 \\ -5500 \\ \hline 4,100 \end{array}$$

The difference in the max. and min. area is 4,100 sq. yds

b. Would a field with a width of 75 yards and an area of 7,500 square yards be within FIFA regulation? Why or why not?

$75 \times 100 = 7,500$

Width of 75 yds
Length of 100 yds

No, The length is 100 yards which is less than the minimum length of 110 yds.

c. It costs $26 to fertilize, water, mow, and maintain each square yard of a full size FIFA field (with maximum dimensions) before each game. How much will it cost to prepare the field for next week's match?

Maximum Dimensions $120 yds \times 80 yds = 9,600$ sq. yds

$$\begin{array}{r} 9,600 \\ \times 26 \\ \hline 57,600 \\ 192,000 \\ \hline 249,600 \end{array}$$

It will cost $249,600 to prepare the field.

COMMON CORE | Lesson 9:   Fluently multiply multi-digit whole numbers using the standard algorithm to solve multi-step word problems.   engage^ny   2.B.89

Date: 7/4/13