Name _____ Date _____

1. Fill in the blanks using your knowledge of place value units and basic facts.

a. 23 × 20

Think: 23 ones × 2 tens = 46 tens

23 × 20 = 460

b. 230 × 20

Think: 23 tens × 2 tens = 46 hundreds

230 × 20 = 4,600

c. 41 × 4

41 ones × 4 ones = 164 one

41 × 4 = 164

d. 410 × 400

41 tens × 4 hundreds = 164 thousands

410 × 400 = 164,000

e. 3,310 × 300

331 tens × 3 hundreds = 993 thousands

3,310 × 300 = 993,000

f. 500 × 600

5 hundreds × 6 hundreds = 30 ten thousands

500 × 600 = 300,000

2. Determine if these equations are true or false. Defend your answer using your knowledge of place value and the commutative, associative, and/or distributive properties.

a. 6 tens = 2 tens × 3 tens False, because 2 tens × 3 tens = 6 hundreds or 600

20 × 30 = 600

b. 44 × 20 × 10 = 440 × 2 False. These aren't equal.

I can rewrite 44 × 10 = 440 and 440 × 20 ≠ 440 × 2

c. 86 ones × 90 hundreds = 86 ones × 900 tens

True, because 90 hundreds is equal to 900 tens which equals the value of 9,000

d. 64 × 8 × 100 = 640 × 8 × 10

True, I can rewrite the problem to be

8 × 64 × 100 = 8 × 640 × 10. 64 × 100 is equal to 640 × 10

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e. $57 \times 2 \times 10 \times 10 \times 10 = 570 \times 2 \times 10$ False

I can rewrite the problem to be $57 \times 2 \times 1{,}000$ on the left side.

$57 \times 2 \times 1000 \neq 570 \times 2 \times 10$

3. Find the products. Show your thinking. The first row gives some ideas for showing your thinking.

a. 7×9	7×90	70×90	70×900
$= 63$	$= 63 \times 10$	$= (7 \times 10) \times (9 \times 10)$	$= (7 \times 9) \times (10 \times 100)$
	$= 630$	$= (7 \times 9) \times 100$	$= 63{,}000$
		$= 6{,}300$	
b. 45×3	45×30	450×30	450×300
$= 135$	$= 135 \times 10$	$= (45 \times 10) \times (3 \times 10)$	$= 45 \times 3 \times (10 \times 100)$
	$= 1{,}350$	$= (45 \times 3) \times 100$	$= 135 \times 1{,}000$
		$= 13{,}500$	$= 135{,}000$
c. 40×5	40×50	40×500	$400 \times 5{,}000$
$= 200$	$= 20 \times 100$	$= (4 \times 10) \times (5 \times 100)$	$= (4 \times 5) \times (100 \times 1{,}000)$
	$= 2{,}000$	$= (4 \times 5) \times 1{,}000$	$= 20 \times 100{,}000$
		$= 20{,}000$	$= 2{,}000{,}000$
d. 718×2	$7{,}180 \times 20$	$7{,}180 \times 200$	$71{,}800 \times 2{,}000$
$= 1{,}436$	$= 1{,}436 \times 100$	$= (718 \times 10) \times (2 \times 100)$	$= (718 \times 2) \times (100 \times 1{,}000)$
	$= 143{,}600$	$= (718 \times 2) \times (10 \times 100)$	$= 1436 \times 100{,}000$
		$= 1436 \times 1{,}000$	$= 143{,}600{,}000$
		$= 1{,}436{,}000$	

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Unit vs. Sec
Prob. #5
unit thinking helps them see the structure of the problem →

Abbreviated tape diagram
Prob. #6 May need to model so students don't draw 600 units

4. Ripley told his mom that multiplying whole numbers by multiples of 1 zeros in the factors and put them in the product. He used these two e

7,000 ×	600	= 4,200,000	800 ×	
(3 zeros)	(2 zeros)	(5 zeros)	(2 zeros)	

a. Ripley's mom said his strategy won't always work. Why not? Giv

This strategy won't always work because it depends on the factors that you are multiplying. For example

$\boxed{400 \times 500 = 200{,}000}$
(2 zeros) (2 zeros) (5 zeros)

doesn't work because $4 \times 5 = 20$, so the product will have an extra zero from multiplying the two factors.

5. The Canadian side of Niagara Falls has a flow rate of 600,000 gallons per second. How many gallons of water flow over the falls in 1 minute?

1 unit = 1 sec.

1 unit = 600,000 gal.

60 units = 600,000 × 60 = 36,000,000

36,000,000 gal. of water will flow over the falls in one minute.

6. Tickets to a baseball game are $20 for an adult and $15 for a student. A school buys tickets for 45 adults and 600 students. How much money will the school spend for the tickets?

45 twenties

Adult | $20 | $20 | ... (43) | $20 |

$20 × 45 = $900

600 fifteens

Student | $15 | $15 | ... (597) | $15 |

$15 × 600 = $9000

$900
+ $9000
$9,900

The school will spend $9,900 for the tickets.

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Name _____ Date _____

1. Find the products.

a. 1,900 × 20

(19 X 100) X (2 X 10)
(19 X 2) X 1,000
38 X 1,000
38,000

b. 6,000 × 50

(6 X 1,000) X (5 X 10)
(6 X 5) X 10,000
30 X 10,000
300,000

c. 250 × 300

(25 X 10) X (3 X 100)
(25 X 3) X 1,000
75 X 1,000
75,000

2. Explain how knowing 50 × 4 = 200 helps you find 500 × 400.

(50 X 4) X (10 X 100)
200 X (1,000)
200,000

500 is 50 tens
400 is 4 hundreds
ten X hundred = thousand

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Name _____ Date _____

1. Fill in the blanks using your knowledge of place value units and basic facts.

   a. 43 × 30

   Think: 43 ones × 3 tens = 129 tens

   43 × 30 = 1,290

   b. 430 × 30

   Think: 43 tens × 3 tens = 129 hundreds

   430 × 30 = 12,900

   c. 830 × 20

   Think: 83 tens × 2 tens = 166 hundreds

   830 × 20 = 16600

   d. 4,400 × 400

   44 hundreds × 4 hundreds = 176 ten-hundreds

   4,400 × 400 = 1,760,000

   e. 80 × 5,000

   8 tens × 5 thousands = 40 ten-thousands

   80 × 5,000 = 400,000

2. Determine if these equations are true or false. Defend your answer using your knowledge of place value and the commutative, associative, and/or distributive properties.

   a. 35 hundreds = 5 tens × 7 tens True 5 tens × 7 tens = 35 hundreds

   b. 770 × 6 = 77 × 6 × 100 False 770 × 6 = 77 × 10 × 6

   c. 50 tens × 4 hundreds = 40 tens × 5 hundreds True 50 tens = 5 hundreds
   4 hundreds = 40 tens

   d. 24 × 10 × 90 = 90 × 2,400 False 24 × 10 ≠ 2,400
   240 ≠ 2,400

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3. Find the products. Show your thinking. The first row gives some ideas for showing your thinking.

a. 5×5
$= 25$

5×50
$= 25 \times 10$
$= 250$

50×50
$= (5 \times 10) \times (5 \times 10)$
$= (5 \times 5) \times 100$
$= 2{,}500$

50×500
$= (5 \times 5) \times (10 \times 100)$
$= 25{,}000$

b. 80×5
$= 400$

80×50
$= 40 \times 100$
$= 4{,}000$

800×500
$= (8 \times 100) \times (5 \times 100)$
$= 8 \times 5 \times 10{,}000$
$= 400{,}000$

$8{,}000 \times 50$
$= (8 \times 5) \times (1000 \times 10)$
$= 40 \times 10{,}000$
$= 400{,}000$

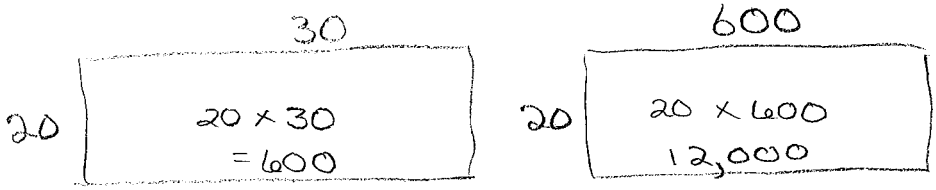
c. 637×3
$= 1{,}911$

$6{,}370 \times 30$
$= 1{,}911 \times 100$
$= 191{,}100$

$6{,}370 \times 300$
$= (637 \times 10) \times (3 \times 100)$
$= (637 \times 3) \times (10 \times 100)$
$= 1{,}911 \times 1{,}000$
$= 1{,}911{,}000$

$63{,}700 \times 300$
$= (637 \times 3) \times (100 \times 100)$
$= 1{,}911 \times 10{,}000$
$= 19{,}110{,}000$

4. A concrete stepping stone measures 20 inches square. What is the area of 30 such tiles?



$600 \times 20 = 12{,}000$ in.^{2}

5. A number is 42,300 when multiplied by 10. Find the product of this number and 500.

number $= 4{,}230$

$4{,}230 \times 500$
$= (423 \times 10) \times (5 \times 100)$
$= (423 \times 5) \times (10 \times 100)$
$= 2{,}115 \times 1{,}000$
$= 2{,}115{,}000$

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A # Correct _____

Multiply.

1	9 x 10 =	90	23	73 x 1,000 =	73,000
2	9 x 100 =	900	24	60 x 10 =	600
3	9 x 1,000 =	9,000	25	600 x 10 =	6,000
4	8 x 10 =	80	26	600 x 100 =	60,000
5	80 x 10 =	800	27	65 x 100 =	6,500
6	80 x 100 =	8,000	28	652 x 100 =	65,200
7	80 x 1,000 =	80,000	29	342 x 100 =	34,200
8	7 x 10 =	70	30	800 x 100 =	80,000
9	70 x 10 =	700	31	800 x 1,000 =	800,000
10	700 x 10 =	7,000	32	860 x 1,000 =	860,000
11	700 x 100 =	70,000	33	867 x 1,000 =	867,000
12	700 x 1,000 =	700,000	34	492 x 1,000 =	492,000
13	2 x 10 =	20	35	34 x 10 =	340
14	30 x 10 =	300	36	629 x 10 =	6,290
15	32 x 10 =	320	37	94 x 100 =	9,400
16	4 x 10 =	40	38	238 x 100 =	23,800
17	50 x 10 =	500	39	47 x 1,000 =	47,000
18	54 x 10 =	540	40	294 x 1,000 =	294,000
19	37 x 10 =	370	41	174 x 100 =	17,400
20	84 x 10 =	840	42	285 x 1,000 =	285,000
21	84 x 100 =	8,400	43	951 x 100 =	95,100
22	84 x 1,000 =	84,000	44	129 x 1,000 =	129,000

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B Improvement _____ # Correct _____

Multiply.

1	8 x 10 =	80	23	37 x 1,000 =	37,000
2	8 x 100 =	800	24	50 x 10 =	500
3	8 x 1,000 =	8,000	25	500 x 10 =	5000
4	7 x 10 =	70	26	500 x 100 =	50,000
5	70 x 10 =	700	27	56 x 100 =	5,600
6	70 x 100 =	7,000	28	562 x 100 =	56,200
7	70 x 1,000 =	70,000	29	432 x 100 =	43,200
8	6 x 10 =	60	30	700 x 100 =	70,000
9	60 x 10 =	600	31	700 x 1,000 =	700,000
10	600 x 10 =	6,000	32	760 x 1,000 =	760,000
11	600 x 100 =	60,000	33	765 x 1,000 =	765,000
12	600 x 1,000 =	600,000	34	942 x 1,000 =	942,000
13	3 x 10 =	30	35	74 x 10 =	740
14	20 x 10 =	200	36	269 x 10 =	2,690
15	23 x 10 =	230	37	49 x 100 =	4,900
16	5 x 10 =	50	38	328 x 100 =	32,800
17	40 x 10 =	400	39	37 x 1,000 =	37,000
18	45 x 10 =	450	40	924 x 1,000 =	924,000
19	73 x 10 =	730	41	147 x 100 =	14,700
20	48 x 10 =	480	42	825 x 1,000 =	825,000
21	48 x 100 =	4800	43	651 x 100 =	65,100
22	48 x 1,000 =	48,000	44	192 x 1,000 =	192,000

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Name _____ Date _____

1. Round the factors to estimate the products.

   a. 597 × 52 ≈ 600 × 50 = 30,000

   A reasonable estimate for 597 × 52 is 30,000.

   b. 1,103 × 59 ≈ 1000 × 60 = 60,000

   A reasonable estimate for 1,103 × 59 is 60,000.

   c. 5,840 × 25 ≈ 6000 × 25 = 150,000
   or 6000 × 30 = 180,000

   A reasonable estimate for 5,840 × 25 is 150,000.

2. Complete the table using your understanding of place value and knowledge of rounding to estimate the product.

Factors	Rounded Factors	Estimate
a. 2,809 × 42	3,000 × 40	120,000
b. 28,090 × 420	30,000 × 400	12,000,000
c. 8,932 × 59	9,000 × 60	540,000
d. 89 tens × 63 tens	900 × 600	540,000
e. 398 hundreds × 52 tens	40,000 × 500	20,000,000

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3. For which of the following expressions would 200,000 be a reasonable estimate? Explain how you know.

2,146 × 12	21,467 × 121	2,146 × 121	21,477 × 1,217
2,000 × 10	21,000 × 100	2,000 × 100	21,000 × 1,000
20,000	2,100,000	200,000	21,000,000

4. Fill in the missing factors to find the given estimated product.

a. 571 × 43 ≈ 600 × 40 = 24,000

b. 726 × 674 ≈ 700 × 700 = 490,000

c. 8,379 × 541 ≈ 8,000 × 500 = 4,000,000

5. There are 19,763 tickets available for a New York Knicks home game. If there are 41 home games in a season, about how many tickets are available for all the Knicks' home games?

19,763 × 41 ≈ 20,000 × 40 ≈ 800,000
There are about 800,000 tickets available.

6. Michael saves $423 dollars a month for college.

a. About how much money will he have saved after 4 years?

4 years × 12 months/yr = 48 months ≈ 50 months

$423 × 50 months ≈ $400 × 50 months ≈ $20,000

He would save about $20,000 in 4 years.

b. Will your estimate be lower or higher than the actual amount Michael will save? How do you know?

I think the estimate is really close because I rounded $423 down but rounded 48 months up.

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Name _____ Date _____

1. Round the factors to estimate the products.

   a. 697 × 82 ≈ 700 × 80 = 56,000

   A reasonable estimate for 697 × 82 is 56,000.

   b. 5,897 × 67 ≈ 6000 × 70 = 420,000

   A reasonable estimate for 5,897 × 67 is 420,000.

   c. 8,840 × 45 ≈ 9,000 × 50 = 450,000

   A reasonable estimate for 8,840 × 45 is 450,000

2. Complete the table using your understanding of place value and knowledge of rounding to estimate the product.

Factors	Rounded Factors	Estimate
a. 3,409 × 73	3,000 × 70	210,000
b. 82,290 × 240	80,000 × 200	16,000,000
c. 9,832 × 39	10,000 × 40	400,000
980 360 d. 98 tens × 36 tens	1000 × 400	400,000
89,300 850 e. 893 hundreds × 85 tens	90,000 × 900	81,000,000

3. The estimated answer to a multiplication problem is 800,000. Which of the following expressions could result in this answer? Explain how you know.

No	No	Yes	No
8,146 × 12	81,467 × 121	8,146 × 121	81,477 × 1,217
8000 × 10	80,000 × 100	8000 × 100	80,000 × 1,000
80,000	8,000,000	800,000	80,000,000

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4. Fill in the blank with the missing estimate.

   a. 751 × 34 ≈ 800 × 30 = 24,000

   b. 627 × 674 ≈ 600 × 700 = 420,000

   c. 7,939 × 541 ≈ 8,000 × 500 = 4,000,000

5. In a single season the New York Yankees sell an average of 42,362 tickets for each of their 81 home games. About how many tickets do they sell for an entire season of home games?

   42,362 X 81 = T
   40,000 X 80 = 3,200,000 tickets

6. Raphael wants to buy a new car.

   a. He needs a down payment of $3,000. If he saves $340 each month, about how many months will it take him to save the down payment?

   3,000 ÷ 300 = 10 months

   b. His new car payment will be $288 each month for five years. What is the total of these payments?

   $288 X 12 X 5 = $17,280

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Name _____ Date _____

1. Round the factors and estimate the products.

a. 656 × 106 ≈

700 X 100 = 70,000

b. 3,108 × 7,942 ≈

3,000 X 8,000 = 24,000,000

c. 425 × 9,311 ≈

400 X 9,000 = 3,600,000

d. 8,633 × 57,008 ≈

9,000 X 60,000 = 540,000,000

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