Multiplication/Division Puzzles

Solve the multiplication/division puzzles mentally. Fill in the blank boxes.

Examples:

*, /	300	2,000
2	600	4,000
3	900	6,000

*, /	80	50
4	320	200
8	640	400

1.

*, /	70	400
8		
9		

2.

*, /	5	7
80		
600		

3.

*, /	9	4
50		
7,000		

4.

*, /		600
7	3,500	
		2,400

5.

*, /		80
30	2,700	
		56,000

6.

*, /	4,000	
	36,000	
20		10,000

Make up and solve some puzzles of your own.

7.

*, /		

8.

*, /		

Practice

9. —————— = 0.56 + 0.92

10. —————— = 2.86 − 1.73

11. 19.11 − 10.94 = —————

12. —————— = 0.52 + 0.25

139

SL 4-5-1 Option B: Multiplication & Division   Name _____

*Use a separate sheet of paper if you need more work space for any of these problems. **No Calculators**.*

Solve the multiplication/division puzzles mentally. Fill in the blank boxes.

Examples:

×,/	300	2,000
2	600	4,000
3	900	6,000

×,/	80	50
11		
12		

1.

×,/	60	400
½		
¼		

2.

×,/	0.5	1.5
80		
600		

3.

×,/	9	4
50		
7,000		

4.

×,/		600
7	3,500	
		2,400

5.

×,/		80
30	2,700	
		56,000

6.

×,/	4,000	
	36,000	
0.25		10,000

Make up and solve a number problem of your own.

7.

×,/	1/3	2/5
300		
75		

8.

×,/		

Practice: Find the missing values.

8. m − 0.56 = 0.92   **9.** P + 1.73 = 2.86   **10.** 19.11 − n = 8.17   **11.** Q − 0.52 = 0.25

5·2 Extended Multiplication Facts

Solve mentally.

1. 6 * 7 = _____

   6 * 70 = _____

   60 * 7 = _____

   60 * 70 = _____

   600 * 7 = _____

   60 * 700 = _____

2. 9 * 3 = _____

   9 * 30 = _____

   90 * 3 = _____

   90 * 30 = _____

   900 * 3 = _____

   90 * 300 = _____

3. 4 * 8 = _____

   4 * 80 = _____

   40 * 8 = _____

   40 * 80 = _____

   400 * 8 = _____

   40 * 800 = _____

4. 5 * _____ = 15

   30 * _____ = 150

   30 * _____ = 1,500

   _____ * 50 = 150

   _____ * 500 = 1,500

   30 * _____ = 15,000

5. 54 is _____ times as many as 9.

   540 is _____ times as many as 90.

   5,400 is _____ times as many as 90.

   540 is 60 times as many as _____.

   5,400 is 6 times as many as _____.

   54,000 is 6 times as many as _____.

Practice

6. _____ = 6.3 + 8.7

7. 7.36 + 2.14 = _____

8. _____ = 9.74 − 5.48

9. _____ = 4.6 − 2.8

SL 4-5-2 Option B: Extended Multiplication Facts   Name _____

Use a separate sheet of paper if you need more work space for any of these problems. **No Calculators.**

Solve Mentally.

1.

$6 \cdot 7 =$ _____

$6 \cdot 70 =$ _____

$60 \cdot 7 =$ _____

$60 \cdot 70 =$ _____

$600 \cdot 7 =$ _____

$60 \cdot 700 =$ _____

2.

$9 \cdot 3 =$ _____

$8 \cdot 30 =$ _____

$70 \cdot 3 =$ _____

$60 \cdot 30 =$ _____

$500 \cdot 3 =$ _____

$40 \cdot 300 =$ _____

3.

$4 \cdot 8 =$ _____

$5 \cdot 80 =$ _____

$60 \cdot 8 =$ _____

$70 \cdot 80 =$ _____

$800 \cdot 8 =$ _____

$90 \cdot 800 =$ _____

4.

$6 ($_____$) = 42$

$60 ($_____$) = 240$

$60 ($_____$) = 4800$

$($_____$) \, 60 = 300{,}000$

$($_____$) \, 60 = 18{,}000$

$60 ($_____$) = 5400$

4.

54 is _____ times as many as 9.

7200 is _____ times as many as 90.

360 is _____ times as many as 90.

27,000 is _____ times as many as 90.

630,000 is _____ times as many as 900.

5. Tamara and Eli were asked to multiply 12 and 32 mentally.

Tamara used the method: $12(32) = 12(30 + 2) = 12(30) + 12(2) = 360 + 24 = 384$ to find the answer.

Eli used the method: $(12)(32) = (10 + 2)(30 + 2) = 10(30) + 2(2) = 300 + 4 = 304$ to find the answer.

Together they are working to figure out who is correct and who is incorrect.

    a. Who do you think is correct?

    b. Explain to the person who is incorrect how to fix their work.

6. Aaron multiplied 800(0.53) by thinking of the problem like this: $800(\frac{1}{2}) + 800(\frac{3}{100}) = 400 + 24 = 424$. Explain why

Aaron is or is not correct.

STUDY LINK 5·3 | **Estimating Sums**

For all problems, write a number model to estimate the sum.

◆ If the estimate is greater than or equal to 1,500, find the exact sum.

◆ If the estimate is less than 1,500, **do not** solve the problem.

1. 867 + 734 = _____

Number model:

_____

2. 374 + 962 + 488 = _____

Number model:

_____

3. 382 + 744 = _____

Number model:

_____

4. 581 + 648 + 366 = _____

Number model:

_____

5. 318 + 295 + 493 = _____

Number model:

_____

6. 845 + 702 = _____

Number model:

_____

7. 694 + 210 + 386 = _____

Number model:

_____

8. 132 + 692 + 803 = _____

Number model:

_____

9. 756 + 381 + 201 = _____

Number model:

_____

10. 575 + 832 = _____

Number model:

_____

Practice

11. 60 * 80 = _____

12. 30 * 70 = _____

13. 50 * 900 = _____

14. 40 * 800 = _____

SL 4-5-3 Option B: Estimating Sums   Name _____

Use a separate sheet of paper if you need more work space for any of these problems. **No Calculators.**

For all problems, write a number model to estimate the sum.

♦ If the estimate is greater than or equal to 1,500, find the exact sum.

♦ If the estimate is less than 1,500, **do not** solve the problem.

1. 867 + 734 = _____

     Number model:

     _____

2. 374 + 962 + 488 = _____

     Number model:

     _____

3. 382 + 744 = _____

     Number model:

     _____

4. 581 + 648 + 366 = _____

     Number model:

     _____

5. A library has 21,895 books on the shelves. 8,752 of the books are checked out on loan. About how many books does the library own? Write a number model

6. Sam has his five favorite songs in an ipod playlist. The songs run 155 seconds, 189 seconds, 177 seconds 253 seconds and 223 seconds in length.

     a. About how many seconds will it take to complete this playlist? Write a number model.

     b. About how many minutes is this?

7. There are 180 school days in a year. Since starting kindergarten, about how many days have you been in school? Describe how you found your answer.

8. Use the each of the digits 1, 2, 3, 4, 5, 6, 7, 8, 9 exactly once to create three, 3-digit numbers so that:

     a. The sum of the three numbers is the largest possible sum. Find the sum.

     b. The sum of the three numbers is the smallest possible sum. Find the sum.

     c. Explain how you know your answer to a is the largest possible sum.

9. Estimate the number of days in one year, eight months and three weeks.

Practice: _____

10. 30·80 = _____   11. 40·8000 = _____   12. 60·800 = _____

STUDY LINK 5·4 **Estimating Products**

Estimate whether the answer will be in the tens, hundreds, thousands, or more. Write a number model to show how you estimated. Then circle the box that shows your estimate.

1. A koala sleeps an average of 22 hours each day. About how many hours does a koala sleep in a year?

Number model: _____

10s	100s	1,000s	10,000s	100,000s	1,000,000s

2. A prairie vole (a mouselike rodent) has an average of 9 babies per litter. If it has 17 litters in a season, about how many babies are produced?

Number model: _____

10s	100s	1,000s	10,000s	100,000s	1,000,000s

3. Golfers lose, on average, about 5 golf balls per round of play. About how many golf balls will an average golfer lose playing one round every day for one year?

Number model: _____

10s	100s	1,000s	10,000s	100,000s	1,000,000s

4. In the next hour, the people in France will save 12,000 trees by recycling paper. About how many trees will they save in two days?

Number model: _____

10s	100s	1,000s	10,000s	100,000s	1,000,000s

Try This

5. How many digits can the product of two 2-digit numbers have? Give examples to support your answer.

_____

_____

Practice

6. $60 * 7 =$ _____   7. $4 * 80 =$ _____   8. _____ $= 200 * 9$

Use a separate sheet of paper if you need more work space for any of these problems. **No Calculators.**

Estimate whether the answer will be in the tens, hundreds, thousands, or more. Write a number model to show how you estimated. Then circle the box that shows your estimate.

1. A koala sleeps an average of 22 hours each day. About how many hours does a koala sleep in a decade?

Number model: _____

10s	100s	1,000s	10,000s	100,000s	1,000,000s

2. A prairie vole (a mouse like rodent) has an average of 9 babies per liter and can produce 17 liters in a season. If there are 23 liter bearing voles in a colony, how many babies will be produced in a season?

Number model: _____

10s	100s	1,000s	10,000s	100,000s	1,000,000s

3. In the next hour, the people in France will save 12,000 trees by recycling paper. About how many trees will they save in two days?

Number model: _____

10s	100s	1,000s	10,000s	100,000s	1,000,000s

4. The average song is 193 seconds long. Alan's ipod is loaded with 173 songs.

  a. About how many seconds can Alan's ipod play without repeating a song?

  b. About how many minutes is this?

  c. Describe how you made your estimates to *parts a and b.*

5. a. How many digits can the product of two 2-digit numbers have?

  b. How many digits can the product of two 3-digit numbers have?

  c. How many digits can the product of two 4-digit numbers have?

  d. How many digits can the product of two 10-digit numbers have? Explain how you know.

STUDY LINK 5·5 | **Multiplication**

Multiply using the partial-product method. Show your work in the grid below.

1. 56 * 7 = _____ 2. 8 * 275 = _____ 3. _____ = 1,324 * 9

4. Maya goes to school for 7 hours each day. If she does not miss any of the
181 school days, how many hours will Maya spend in school this year?

   a. Estimate whether the answer will be in the tens, hundreds, thousands, or more. Write
   a number model to show how you estimated. Circle the box that shows your estimate.

   Number model: _____

10s	100s	1,000s	10,000s	100,000s	1,000,000s

   b. Exact answer: _____ hours

5. The average eye blinks once every 5 seconds. Is that more than or less than a hundred
thousand times per day? Explain your answer.

_____

_____

Practice

6. _____ = 495 + 7,389   7. 5,638 + 5,798 = _____

8. 3,007 − 1,749 = _____   9. _____ = 8,561 − 3,872

151

*Use a separate sheet of paper if you need more work space for any of these problems. **No Calculators.***

Multiply using the partial-product method. Show your work in the grid below.

1. 56 * 7 = _____   2. 8 * 275 = _____   3. _____ = 1,324 * 9

4. Maya goes to school for 7 hours each day. If she does not miss any of the
181 school days, how many hours will Maya spend in school this year?

a. Estimate whether the answer will be in the tens, hundreds, thousands, or more. Write
a number model to show how you estimated. Circle the box that shows your estimate.

Number model: _____

10s	100s	1,000s	10,000s	100,000s	1,000,000s

b. Exact answer: _____ hours

5. The average eye blinks once every 5 seconds. Is that more than or less than a hundred
thousand times per day? Explain your answer.

_____

_____

6. One word in each list does not fit with the others. Cross this word off the list and give the list a title.

Scalene		Tenths		Millimeters		Tenths	
Right		Fractions		Centimeters		Thirds	
Isosceles		Decimals		Liters		Hundredths	
Equilateral		Hundredths		Kilometers		Thousandths	
Quadrilateral		Thousands		Decimeters		Ones	

7. Write a sentence that uses both of the words in each part correctly.

a. product, estimate

b. trapezoid, quadrilateral

c. metric, length

d. solve, open-sentence

e. product, quotient

Practice. _____

8. 3,007 − 1749 = _____   9. _____ = 8561 − 3872

More Multiplication

Multiply using the partial-products algorithm. Show your work.

1. 582 * 7 = _____   2. 56 * 30 = _____

3. 42 * 50 = _____   4. _____ = 27 * 18

5. _____ = 46 * 71   6. 340 * 50 = _____

Try This

7. _____ = 241 * 31   8. _____ = 768 * 49
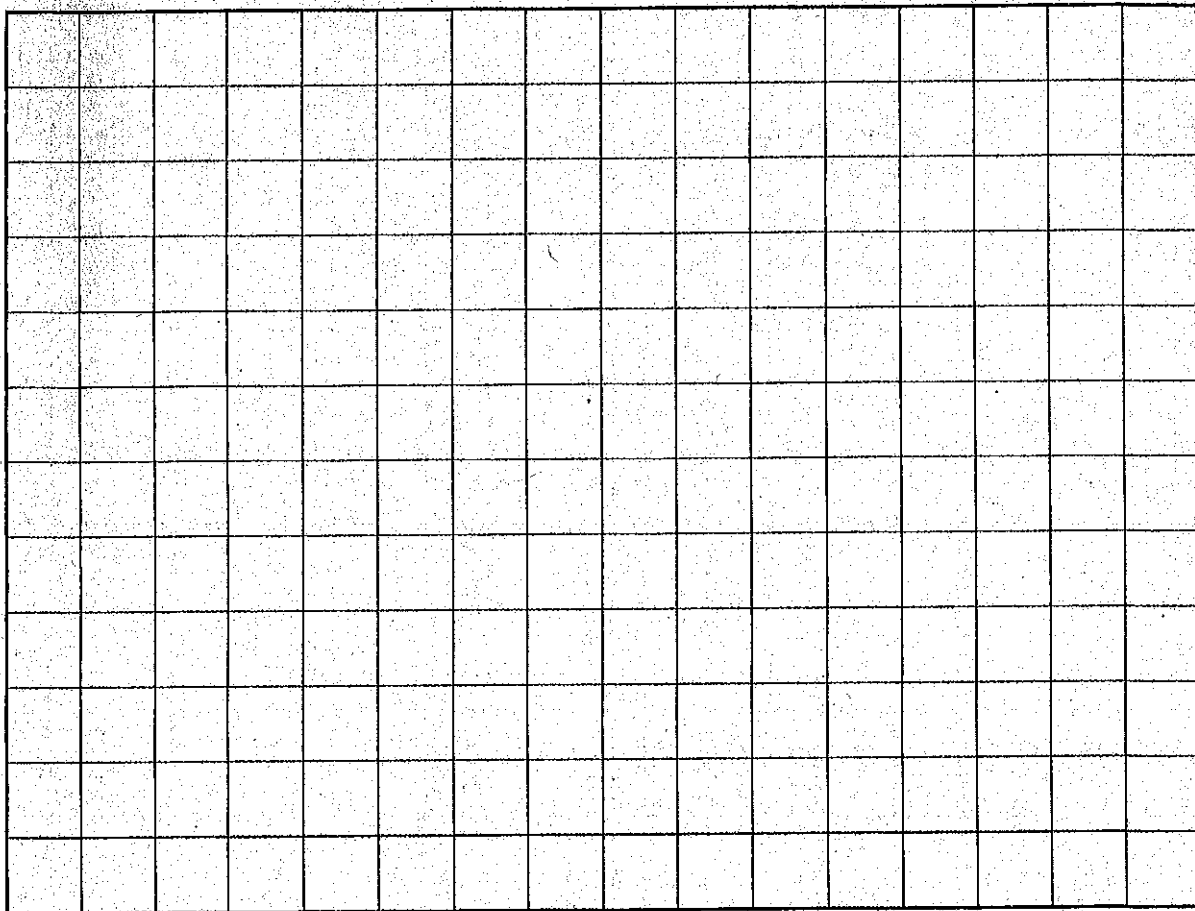
Practice

9. _____ = 283 + 5,439   10. 6,473 + 4,278 = _____

11. 5,583 − 4,667 = _____   12. _____ = 9,141 − 6,372

SL 4-5-6 Option B: More Multiplication   Name _____

Use a separate sheet of paper if you need more work space for any of these problems. **No Calculators**

Multiply using the partial-products algorithm. Show your work.

1. 582 * 7 = _____

2. 56 * 30 = _____

3. 42 * 50 = _____

4. _____ = 27 * 18

5. _____ = 46 * 71

6. 340 * 50 = _____

Try This

7. _____ = 241 * 31

8. _____ = 768 * 49

9. Kevin said, "When you multiply a number by ten you just add a zero after the number". Karen says that Kevin is incorrect. Give examples that support Karen's position and explain why she is correct.

10. Complete each statement.

   a. Product is to quotient as _____ is to difference.

   b. Square is to rectangle as _____ is to parallelogram.

   c. Tens are to hundreds as hundredths are to _____.

   d. Cents are to dollars as _____ are to meters.

Practice: _____

11. _____ = 283 + 5,439

12. _____ = 9,141 − 6,372
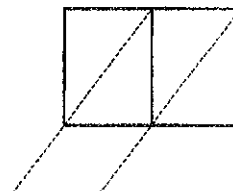
STUDY LINK 5·7 | **Lattice Multiplication**

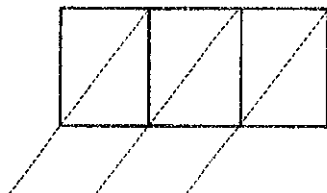Use the lattice method to find the following products.

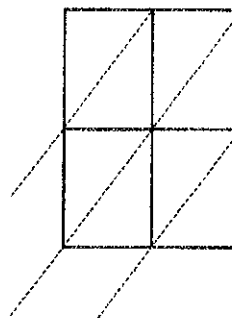**1.** 5 * 46 = _____
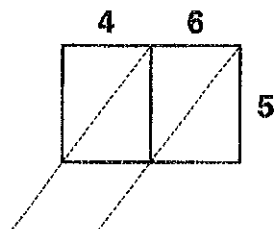
2. 8 * 67 = _____

3. 7 * 836 = _____

4. 4 * 329 = _____
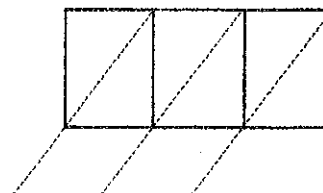
5. 25 * 31 = _____
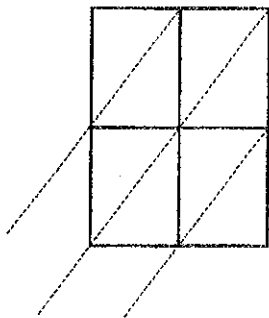
6. 49 * 52 = _____

7. Use the lattice method and the partial-products method to find the product.

84 * 78 = _____

Practice

8. _____ = 33.67 + 5.9

9. 68.4 + 5.82 = _____

10. 71.44 − 37.67 = _____

11. _____ = 101.06 − 29.91

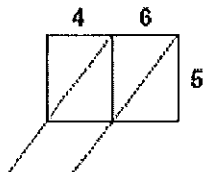# SL 4-5-7 Option B: Lattice Multiplication   Name _____

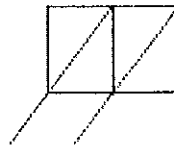*Use a separate sheet of paper if you need more work space for any of these problems.* **No Calculators.**

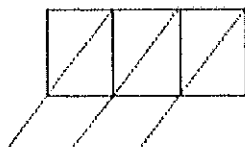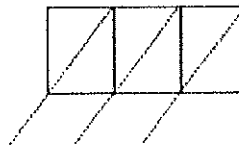Use the lattice method to find the following products.

1. 5 * 46 = _____

2. 8 * 67 = _____

3. 7 * 836 = _____

4. 4 * 329 = _____

5. 25 * 31 = _____
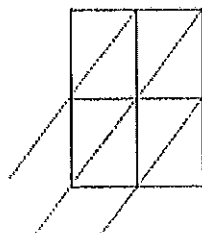
6. 49 * 52 = _____
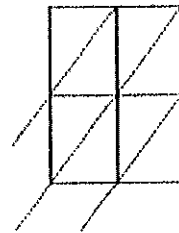
7. For the problem 32 x 24.

   a. Work the problem using the partial problems method.

   b. Work the problem with the lattice method.

   c. Use your work in parts a and b to describe how the methods are similar and different.

8. Use the partial products method to explain why (23)(41) will have the same answer as (41)(23).

9. Lenny worked the problem (28)(17) using the method below. Is Lenny correct? Explain why or why not.

   (28)(17) = (20 + 8)(10 + 7)

   = 20(10) + 8(7)

   = 200 + 56

STUDY LINK 5·8 Place-Value Puzzle

Use the clues below to fill in the place-value chart.

Billions				Millions				Thousands				Ones		
100B	10B	1B	,	100M	10M	1M	,	100Th	10Th	1Th	,	100	10	1

1. Find $\frac{1}{2}$ of 24. Subtract 4. Write the result in the hundreds place.

2. Find $\frac{1}{2}$ of 30. Divide the result by 3. Write the answer in the ten-thousands place.

3. Find 30 ÷ 10. Double the result. Write it in the one-millions place.

4. Divide 12 by 4. Write the answer in the ones place.

5. Find 9 * 8. Reverse the digits in the result. Divide by 3.
   Write the answer in the hundred-thousands place.

6. Double 8. Divide the result by 4. Write the answer in the one-thousands place.

7. In the one-billions place, write the even number greater than 0
   that has not been used yet.

8. Write the answer to 5 ÷ 5 in the hundred-millions place.

9. In the tens place, write the odd number that has not been used yet.

10. Find the sum of all the digits in the chart so far.
    Divide the result by 5, and write it in the ten-billions place.

11. Write 0 in the empty column whose place value is less than billions.

12. Write the number in words. For example, 17,450,206 could be written as
    "17 million, 450 thousand, 206."

_____

_____

Practice

13. 74 * 5 = _____

14. _____ = 396 * 8

15. _____ = 92 * 18

16. 56 * 47 = _____

163

STUDY LINK 5·9

Many Names for Powers of 10

Below are different names for powers of 10. Write the names in the appropriate name-collection boxes. Circle the names that do not fit in any of the boxes.

1,000,000	10,000	1,000
100	10	10 [100,000s]
10 [10,000s]	10^6	10 [1,000s]
10^3	10 * 10 * 10 * 10	one thousand
10^5	10 * 10 * 10 * 10 * 10	10 [10s]
10 * 10	ten	10^1
10 [tenths]	10^0	1

1.

100,000

2.

10^2

3.

1 million

4.

one

5.

10 * 10 * 10

6.

10^4

Practice

7. 63 * 7 = _____

8. _____ = 495 * 6

9. _____ = 97 * 53

167

Use a separate sheet of paper if you need more work space for any of these problems. **No Calculators.**

Below are different names for powers of 10. Write the names in the appropriate
name-collection boxes. Circle the names that do not fit in any of the boxes.

1,000,000	10,000	1,000
1/10 of a million	10	10 [100,000s]
10 [10,000s]	10^6	10 [1,000s]
10^3	10 * 10 * 10 * 10	one thousand
10^5	10 * 10 * 10 * 10 * 10	10 [10s]
10 * 10	10^2 [1000s]	1000 [tenths]
10 [tenths]	10^0	$(10^3) \div 1000$

1.

100,000

2.

10^2

3.

1 million

4.

one

5.

10 * 10 * 10

6.

10^4

7. Lecia noticed that 1,000 x 100 = 100,000 is the same as 10^3 x 10^2 = 10^5. Lecia predicts that 10^4 x 10^5 will equal 10^9. Is Lecia's prediction correct? Explain why or why not.

8. Consider the pattern below. Describe how the pattern can be used to explain why $10^0 = 1$.

$10^3 = 10 \cdot 10 \cdot 10 = 1000$
$10^2 = 10 \cdot 10 = 100$
$10^1 = 10 = 10$
$10^0 = 1$

Practice: _____

    9. 973 x 54 = _____

STUDY LINK 5·10

Rounding

SRB 182 183

1. Round the seating capacities in the table below to the nearest thousand.

Women's National Basketball Association Seating Capacity of Home Courts		
Team	**Seating Capacity**	**Rounded to the Nearest 1,000**
Charlotte Sting	24,042	
Cleveland Rockers	20,562	
Detroit Shock	22,076	
New York Liberty	19,763	
Phoenix Mercury	19,023	
Sacramento Monarchs	17,317	
San Antonio Stars	18,500	
Seattle Storm	17,072	

2. Look at your rounded numbers. Which stadiums have about the same capacity?

_____

3. Round the population figures in the table below to the nearest million.

U.S. Population by Official Census from 1940 to 2000		
Year	**Population**	**Rounded to the Nearest Million**
1940	132,164,569	
1960	179,323,175	
1980	226,542,203	
2000	281,421,906	

Source for both tables: The World Almanac and Book of Facts 2004

| Practice |

4. _____ = 692 ∗ 6   **5.** _____ = 38 ∗ 21   **6.** 44 ∗ 73 = _____

*Use a separate sheet of paper if you need more work space for any of these problems. **Calculators OK.***

1. Round the seating capacities in the table below to the nearest thousand.

Women's National Basketball Association Seating Capacity of Home Courts		
Team	Seating Capacity	Rounded to the Nearest 1,000
Charlotte Sting	24,042	
Cleveland Rockers	20,562	
Detroit Shock	22,076	
New York Liberty	19,763	
Phoenix Mercury	19,023	
Sacramento Monarchs	17,317	
San Antonio Stars	18,500	
Seattle Storm	17,072	

2. How much more seating capacity does the largest court have compared to the smallest court? Show your work.

3. If the combined capacity for all of these courts remained unchanged but all courts were required to have the exact same capacity, what would be the capacity of each court? Show your work.

4. Half of all courts in the list above have a capacity above what number? Explain how you got your answer.

5. Identify your answers in problems 2, 3 and 4 as the Mean, the Median or the Range.

6. Rico estimated the seating capacity at the Pepsi Center to be around 18,000 seats. A friend said he was correct to the nearest thousand.
  a. What is the largest capacity possible for the Pepsi Center if Rico's estimate is correct to the nearest thousand? Explain your thinking.

  b. What is the smallest capacity possible for the Pepsi Center if Rico's estimate is correct to the nearest thousand? Explain your thinking.

STUDY LINK 5·11 **Comparing Data**

This table shows the number of pounds of fruit produced by the top 10 fruit-producing countries in 2001. Read each of these numbers to a friend or a family member.

Country	Pounds of Fruit
Brazil	77,268,294,000
China	167,046,420,000
France	26,823,740,000
India	118,036,194,000
Iran	28,599,912,000
Italy	44,410,538,000
Mexico	34,549,912,000
Philippines	27,028,556,000
Spain	36,260,392,000
United States	73,148,598,000

1. Which country produced the most fruit?

   _____

2. Which country produced the least fruit?

   _____

3. For each pair, circle the country that produced more fruit.

   a. India   Mexico

   b. United States   Iran

   c. Brazil   Philippines

   d. Spain   Italy

4. Which two countries together produced about as much fruit as India?

   _____

Practice

Estimate the sum. Write a number model.

5. 687 + 935 _____

6. 2,409 + 1,196 + 1,327 _____

7. 11,899 + 35,201 _____

172