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               *Spanish Speaking; *Teaching Methods

ABSTRACT
               This supplementary math curriculum guide for use with
Spanish-speaking, fouth through sixth grade students in Chicago
public schools employs a contrastive analysis approach. Lessons are
presented for objectives for which the instructional strategies used
in the United States differ from those used in Spanish-speaking
countries. (Objectives for which the methodology is the same are
taught from the standard math curriculum.) Every lesson has four
parts: (1) an explanation of the differences in the instructional
strategies used in the Spanish-speaking countries and in the U.S.;
(2) a student activity, in Spanish, to reinforce students' skills in
using their native language and methodologies; (3) suggestions for
facilitating the students' transition from their native methodology
to the U.S. methodology; and (4) a transitional activity which
provides students with practice in solving problems using both
methodologies and languages. The major topics covered are place
value, operations with whole numbers, rational numbers, and
measurement. An English-Spanish vocabulary list is provided. (CMG)

SUPPLEMENT FOR CURRICULUM GUIDE FOR MATHEMATICS:

SPANISH-SPEAKING STUDENTS

GRADES 4-6

SUPLEMENTO DE LA GUIA DIDACTICA DE MATEMATICAS

PARA LOS ESTUDIANTES DE HABLA HISPANA

CUATRO-SEXTO GRADOS

FIELD TEST

RUTH B. LOVE

General Superintendent of Schools

BOARD OF EDUCATION

CITY OF CHICAGO

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PREFACE

A contrastive analysis approach to curriculum development is used in the Supplement for Curriculum Guide for Mathematics: Spanish-Speaking Students to enlighten both the bilingual teacher and the English-speaking classroom teacher regarding differences in the teaching methodology of the United States and Spanish-speaking countries.

Lessons have been developed for the objectives for which the instructional strategies used in the United States differ from those used in Spanish-speaking countries. Teachers are requested to use the Curriculum Guide for Mathematics to teach those objectives for which the same methodology is used in the United States and Spanish-speaking countries. It is important to note that instruction in every objective taught in the school system is provided for the Spanish-speaking student.

Every lesson has four parts:

> an explanation for the teachers to acquaint them with the differences in the instructional strategies used in Spanish-speaking countries and in the United States

> an activity for the students to reinforce their skills in using the language and methodology of their native countries

> suggestions for the teachers to facilitate the students' transition from the methodology used in Spanish-speaking countries to the methodology used in the United States

> a transitional activity designed to prepare students to use the standard algorithm of the Chicago public schools curriculum by providing practice in solving problems using the methodology and language of Spanish-speaking countries and the United States.

The sequence of objectives in the mathematics program of the Spanish-speaking countries may vary from that of the Chicago curriculum. Where there is variation in the order of the objectives, the sequence of the Chicago public schools curriculum is used.

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ACKNOWLEDGMENT

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*Titles listed indicate positions held at the time of the
preparation of this publication.

INTRODUCTION

STRAND	GRADE 4* (Level J1)		GRADE 5 (Levels K1, K2, K3)		GRADE 6* (Level L1)	
	Objective	Pages	Objective	Pages	Objective	Pages
Place Value	2-J1-2 2-J1-3	2-5 6-9	2-K1-1 2-K1-3	34-38 39-42	2-L1-1	82-85
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Rational Numbers			4-K1-7 4-K2-3 4-K2-5 4-K3-5 4-K3-6	58-62 63-67 68-71 72-76 77-80	4-L1-13	90-95
Measurement	5-J1-3	27-31				

The major topics included for grades 4-6 are place value, operations with whole numbers, rational numbers, and measurement.

The standard page format provides basic information for each objective. Information includes the following: STRAND, OBJECTIVE, OBJECTIVE CODE, and SUGGESTED ACTIVITIES.

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*Differentiated curriculum activities were not developed for Levels J2, L2, and L3.

GRADE 4

Place Value

2-J1-2   Identify and name the place value of each
          digit in a seven-place number.

2-J1-3   Write numbers, including seven-digit numbers,
          in expanded notation.

Operations with Whole Numbers

3-J1-16   Divide a two-digit dividend by a one-digit
          divisor, with remainder.

3-J1-17   Divide a three-digit dividend by a one-digit
          divisor, with remainder.

3-J1-19   Divide a three-digit dividend by a two-digit
          divisor.

Measurement

5-J1-3   Perform operations with numbers representing
          money values.

STRAND <u>PLACE VALUE</u>   OBJECTIVE CODE <u>2-J1-2</u>

OBJECTIVE Identify and name the place value of each digit
in a seven-place number.

SUGGESTED ACTIVITIES

Word names for numbers used in the Spanish-speaking countries
differ from those used in the United States.

<u>PART I</u>

In some Spanish-speaking countries, such as Spain, the place
value for numbers greater than 999 is shown by using a point
instead of a comma to separate each of the periods. The
periods of three places are called classes.

The place value for millions is shown by a small index
number <u>1</u> placed above and between the period of the thousands
and the millions. Successively, billions and trillions have
a <u>2</u> and a <u>3</u> as indexes.

Spanish-Speaking Countries Method	United States Method
$6^1.596.860$	
$6^1,596,860$	6,596,860
$5^1\ 286\ 370$	5,286,370

PART II   2-J1-2

Usa el punto para separar los períodos y las clases de los
números. Escribe los números dados en palabras:

Ejemplo:

$75321.46 = 7^1\!.532.146$ siete millones, quinientos
                                    treinta y dos mil, ciento
                                    cuarenta y seis

1)   8975236   2)   8194517

3)   7532137   4)   9254378

5)   5894238   6)   8937923

7)   7523787   8)   9276537

Usa la coma para separar los períodos y las clases de los números.
Escribe los números dados en palabras:

Ejemplo:

$7626387 = 7^1\!626,387$ siete millones, seiscientos
                                    veintiseis mil, trescientos
                                    ochenta y siete

1)   6875321   2)   9276751

3)   7824567   4)   2356896

5)   2357682   6)   8245783

7)   9234671   8)   9236752

PART III   2-J1-2

Review place value terminology and period indexes used in
Spanish-speaking countries; then introduce the United States
method.

Examples:

1)   2.795.431   2)   2,795,431

3)   4,873,522   4)   4 873 522

5)   2 804 006

Have the students read the numbers and give the place value
of each digit in both English and Spanish.

The first number above is read as follows:

    1)   Dos millones, setecientos noventa y cinco mil,
         cuatrocientos treinta y uno.

    2)   Two million, seven hundred ninety-five thousand,
         four hundred thirty-one.

Make the students aware of the differences in using the plural
and the singular forms for:

        millones   million

        setecientos   seven hundred

        noventa y cinco mil   ninety-five thousand

        cuatrocientos   four hundred

        treinta y uno   thirty-one

PART IV   2-J1-2

Rewrite the following exercises using both the United States
method and one of the methods used in the Spanish-speaking
countries.

Escribe los siguientes números en ambos métodos; el requerido
en los Estados Unidos y uno de los métodos usados en los paises
de halla hispana.

Spanish-Speaking Countries Method		United States Method
Ejemplo: 2 4 7 4 5 3 6		Example: 2 4 7 4 5 3 6
2.4 7 4,5 3 6		2,4 7 4,5 3 6
2 4 7 4 5 3 6		2 4 7 4 5 3 6

1) 3476879   _____   _____

2) 3467921   _____   _____

3) 8564367   _____   _____

4) 2479652   _____   _____

5) 3576543   _____   _____

6) 2795723   _____   _____

7) 9275684   _____   _____

8) 5457956   _____   _____

9) 1247865   _____   _____

10) 5276953   _____   _____

STRAND **PLACE VALUE**   **OBJECTIVE CODE**   2-J1-3

OBJECTIVE Write numbers, including seven-digit numbers, in expanded notation.

SUGGESTED ACTIVITIES

Expanded notation in some Spanish-speaking countries is worked vertically rather than horizontally.

PART I

Spanish-Speaking Countries Method	United States Method
4 069 503	4,069,503 =
	4,000,000 + 0 +
	60,000 + 9,000 +
	500 + 0 + 3

Multiples of Ten

4 000 000	4 x	1 000 000
000 000	0 x	100 000
60 000	6 x	10 000
9 000	9 x	1 000
500	5 x	100
00	0 x	10
+ 3	3 x	1
4 069 503		

Multiples of Ten

(4x1,000,000) + (0x100,000)
+ (6x10,000) + (9x1,000) +
(5x100) + (0x10) + (3x1)

PART II   2-J1-3

Escribe los siguientes números en notación desarrollada:

1)   9,142,326

2)   7,257,431

3)   4,375,249

4)   6,235,432

5)   3,294,386

8

Have the students convert the vertical expanded notation to the horizontal expanded notation form.

Example:

$$1,349 = \begin{cases} 1,000 \\ 300 \\ 40 \\ +\ \ 9 \end{cases}$$

$$1,000 + 300 + 40 + 9 = 1,349$$

$$\overline{1,349}$$

$$1,349,528 = 1,000,000 + 300,000 + 40,000 + 9,000 + 500 + 20 + 8$$

$$1,349,528 = \begin{cases} 1,000,000 \\ 300,000 \\ 40,000 \\ 9,000 \\ 500 \\ 20 \\ +\ \ \ \ \ \ 8 \end{cases}$$

PART IV   2-J1-3

Compare the two forms of expanded notation.   Write the missing
numbers in the squares.

Compara las dos formas de notación desarrollada y escribe el
número que falta en los cuadros en blanco.

Ejemplo: 3,458,232 = 3, 0 0 0, 0 0 0

                              [4] 0 0, 0 0 0

                                 [5] 0, 0 0 0

                                    [8,] 0 0 0

                                       [2] 0 0

                                          [3] 0

                                             [2]

      3, 0 0 0, 0 0 0 + [4] 0 0, 0 0 0 + [5] 0, 0 0 0 + [8,] 0 0 0

      + [2] 0 0 + [0] 0 + [ ]

1)   2,541,325 = 2,000,000   3) 8,575,268
                  [ ]00,000
                  [ ]0,000
                  [ ]000
                  [ ]00
                  [ ]0
                  [ ]

2)   4) 3,506,939
     4,358,241 = [ ],000,000

                  [ ]00,000

                  [ ]0,000

                  [ ],000

                  [ ]00

                  [ ]0
                     [ ]

STRAND   OPERATIONS WITH WHOLE NUMBERS   OBJECTIVE CODE   3-J1-16

OBJECTIVE   Divide a two-digit dividend by a one-digit divisor, with remainder.

SUGGESTED ACTIVITIES

In the Spanish-speaking countries the methodology for dividing a two-digit number requires that after the student multiplies each of the digits of the quotient by the digit of the divisor, the partial products obtained are subtracted mentally from the respective digits of the dividend. Products are not written under the dividend. The remainder is placed under the dividend. The division symbol used is a right angle facing up from left to right: (⌐___).

PART I

Spanish-Speaking Countries Method	United Stated Method

```
                              1 1        Quotient
           Divisor    Divisor  5 ⌐57
Dividendo    5 7 |5          - 5
           0 7   1 1  Cociente   7
      Residuo  2              - 5
                              2        Remainder
```

Note: The process is explained on page 11.

PART I (continued)   <u>3-J1-16</u>

Spanish-Speaking Countries Method

Ejemplo:

The steps in the process are as follows:

57 |5
    1

Use the 5 tens as the first step. Five goes into 5 one time. Write the one under the line.

57 |5
0   1

Think: 1 x 5 = 5.
Think: 5 - 5 = 0. Write <u>0</u> under the <u>5</u>.

57 |5
07 1

Bring down the next digit, <u>7</u>.

57 |5
07 11
 2

5 goes into 7 one time.
Think: 1 x 5 = 5.
Think: 7 - 5 = 2. Write <u>2</u> under <u>7</u> as the remainder.

Ejemplo:

49 |5
    9

Since 4 is less than 5, divide 5 into 49. 5 goes into 49 nine times. Write <u>9</u> under the line.

49 |5
 4 9

Think: 9 x 5 = 45.
Think: 49 - 45 = 4. Write <u>4</u> under <u>9</u> as the remainder.

PART II

Divide cada uno de los siguientes números usando el símbolo
con el cual estás familiarizado y restando mentalmente:

1)   84 dividido entre 2   8 4 $\lfloor 2$ 2 $\overline{8\ 4}$

2)   72 dividido entre 3

3)   95 dividido entre 3

4)   65 dividido entre 5

5)   80 dividido entre 5

6)   72 dividido entre 6

7)   83 dividido entre 8

8)   91 dividido entre 7

9)   54 dividido entre 6

PART III   3-J1-16

Write an example on the chalkboard and have students explain
both methods, step by step, at the same time that another
student is solving it. Compare the two division algorithms.

$$74 \ \underline{|8} \quad\quad\quad 8 \ \overline{)\ \begin{array}{c} 9 \\ 74 \end{array}}$$

$$2 \quad 9 \quad\quad\quad\quad -\underline{72}$$

$$\boxed{72} \quad\quad\quad\quad\quad\quad 2$$

Note: The number in the box does not appear in the Spanish
        form. The number is subtracted mentally immediately
        after the product is obtained.

PART IV

Divide the following numbers by using both methods:

Divide los siguientes números usando los dos métodos:

Spanish-Speaking Countries Method	United States Method

Ejemplo: Example:

$$98 \underline{|4}$$
$$1 \quad 2$$
$$+$$

$$6\overline{)59}^{\,9}$$

$$98 \underline{|4}$$
$$18 \quad 2\ 4$$
$$2$$
$$+$$

$$6\overline{)59}_{\,5}^{\,9}$$

$$6\overline{)59}^{\,9}$$
$$\underline{-54}$$
$$5$$

$$4\overline{)98}^{\,24}$$
$$\underline{-8}$$
$$18$$
$$\underline{-16}$$
$$2$$

1) $68 \underline{|5}$ $5\overline{)68}$

2) $83 \underline{|7}$ $7\overline{)83}$

3) $97 \underline{|4}$ $4\overline{)97}$

4) $69 \underline{|5}$ $5\overline{)69}$

STRAND   <u>OPERATIONS WITH WHOLE NUMBERS</u>   OBJECTIVE CODE <u>3-J1-17</u>

OBJECTIVE   Divide a three-digit dividend by a one-digit divisor, with remainder.

SUGGESTED ACTIVITIES

The division algorithm in the Spanish-speaking countries is different from the one used in the United States.

<u>PART I</u>

<table>
<tr><td><u>Spanish-Speaking
Countries Method</u></td><td><u>United States
Method</u></td></tr>
</table>

Dividendo Divisor

```
7 6 7  | 3
1 6 ——— 2 5 5  Cociente
  1 7
    2
Residuo
```

```
Divisor  2 5 5  Quotient
      3 | 7 6 7  Dividend
        -6
        ——
         1 6
        -1 5
        ————
          1 7
         -1 5
         ————
            2  Remainder
```

Some of the differences are as follows:

The symbol is different. In South American countries the division sign (—÷—) is used; in Mexico and Cuba, the symbol is an angle opened up (|___); in some regions within a country, the symbol opens down as· in the United States (⌐￣). The dividend is written to the left of the symbol. The divisor is written to the right of the symbol.

The subtraction is done mentally. The partial products do not appear in the algorithm; only the remainders are shown below the digits that were divided.

16

These are the steps in the division process that students in Spanish-speaking countries follow.

```
7 6 7 | 3
1       ②
        6
```

3 goes into 7, two times.

Think: 3 x ② = 6.
Think: 7 - 6 = 1.
Write 1 under the 7.


```
7 6 7 | 3
1 6     2⑤
1       15
```

Bring down the 6 next to the 1.

3 goes into 16, five times.

Think: 3 x ⑤ = 15.
Think: 16 - 15 = 1.
Write 1 under the 16, below the 6.


```
7 6 7 | 3
1 6     2 5⑤
1 7
2    + 15
```

Bring down the 7 next to the 1.

3 goes into 17, five times.

Think: 3 x ⑤ = 15.
Think: 17 - 15 = 2.
Write 2 under the 17, below the 7.

In some of the Latin American countries the division symbol is the same as the one used in the United States (⌐‾). However, the abbreviated form is used to subtract mentally, as follows:

```
     x
     8
6 | 5 3 6
    5
  48  +
```

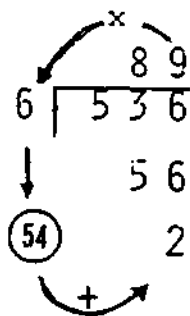6 goes into 53, eight times.

Think: 6 x 8 = 48.
Think: 53 - 48 = 5
Write 5 under the 3.

Bring down the 6 and repeat the step above.

PART 1 (continued)   3-J1-17

```
         x
       8 9
   6 | 5 3 6
       ↓     5 6
     (54)    2
         +
```

6 goes into 56 <u>nine</u> times.

Think: 6 x 9 = 54.
Think: 56 - 54 = 2.
Write <u>2</u> under the 56, below the 6.

PART II   3-J1-17

Divide y comprueba los resultados usando la prueba del nueve.
Sigue el ejemplo.

Ejemplo: Mentalmente dí:

3 3 8 | 7 →x   7 X 4 = 28.

5   4   33 - 28 = 5.
   28

3 3 8 | 7 →x   Baja el 8 para formar 58.

5 8 4 8   7 X 8 = 56.

2   56   58 - 56 = 2.

Prueba del Nueve

        7   El 7 es el divisor.

   5   X   5   El 3 es la suma de los
                               números del cociente.
        3
                               El 5 es el producto de
                               7 X 3, mas el residuo.
                               7 X 3 + 2 = 23
                                        2 + 3 = 5.
                               El otro 5 es la suma de
                               las cifras del dividendo.

(1) 9 6 3 | 7

(2) 7 3 7 | 6

(3) 5 9 6 | 8

(4) 4 8 9 | 5

(5) 7 8 1 | 4

Part III   3-J1-17

After the students have mastered the division algorithm in the short form, teach them to make the transition to the method used in the United States. Use two steps.

Step One.   Move from the algorithm form used in Spanish-speaking countries to the form used in the United States by changing the symbol and the order of the numbers.

          Spanish-Speaking   United States
          Countries Method   Method

Examples:

a)   Divide 365 por 7 ──────────────→ 365 by 7

          365 $\div$ 7

          365 | 7

b)   Divide 365 entre 7 ──────────────→ How many 7's are there in 365?

          365 | 7   7 | 365

For both of these forms, write the remainders only under the dividend immediately after multiplying the divisor by the quotient. Do not write the products.

STEP ONE

365 | 7   52
                                  7 | 365
15   52   15
                                      1
 1

Step Two.   Show the products of each digit of the quotient times the digit of the divisor by writing them under the divisor.

STEP TWO

     52   52
7 | 365   7 | 365
   15   -35
    1   15
                                     -14
                                       1

PART IV   3-J1-17

Compare both algorithm forms in the examples given and fill
in the blanks in the following problems:

Compara ambas formas algorítmicas en los ejemplos dados y
llena los blancos en los problemas siguientes:

Ejemplo:

1)

2)

STRAND   <u>OPERATIONS WITH WHOLE NUMBERS</u>   OBJECTIVE CODE   <u>3-J1-19</u>

OBJECTIVE   Divide a three-digit dividend by a two-digit divisor.

SUGGESTED ACTIVITIES

In Spanish-speaking countries the division algorithm follows a different process from the one used in the United States. The division by a two- or more digit number is accomplished by multiplying the digit of the quotient by the digits of the divisor, one at a time. The product obtained is subtracted mentally from the respective digit of the dividend immediately after the multiplication is done. Only the remainder is written down.

<u>PART I</u>

<table>
<tr><th>Spanish-Speaking
Countries Method</th><th>United States
Method</th></tr>
</table>

```
                                        5 7
  8 6 0 |_1 5_              1 5 | 8 6 0
  1 1 0      5 7               - 7 5
    0 5                        1 1 0
                              - 1 0 5
                                    5
```

```
      5 7                          5 7
 1 5 | 8 6 0               1 5 | 8 6 0
     1 1 0                     -7 5
       0 5                      1 1 0
                               -1 0 5
                                     5
```

PART I   (continued)   3-J1-19

Cast-Out-Nines Method

To check if the division algorithm is done correctly, the
cast-out-nines method is used as follows:

Sum all digits of the dividend, divisor, quotient, and
remainder. If a two-digit number is obtained as the
sum, add again until a one-digit number results.

Q   x   D   +   R   =   D
Quotient   X Divisor   + Remainder   =   Dividend.

```
                    Quotient        5 + 7 = 12
                                    1 + 2 =  3
                        3
                      ╲   ╱
   Dividend    5        ╳        5   QxD + R    3 x 6 + 5 = 23
                      ╱   ╲                     2 + 3 = 5
   8 + 6 = 14          6
   1 + 4 =  5
                    Divisor

                    1 + 5 = 6
```

PART II   3-J1-19

Divide cada uno de los siguientes números entre 23.
Usa el ángulo de dividir que mejor te parezca-- └___ ,┌___ .

1)   8 7 9 └2 3___   6)   6 7 9 └2 3

2)   8 7   7)   9 6 7

3)   9 8 7   8)   7 0 6

4)   9 7 8   9)   9 8 6

5)   7 8 9   10)   9 9 8

         Ejemplo:

         7 9 8 └2 3_
         1 0 8   3 4
           1 6

                    Divisor   Cociente
                       5   7
                    6 ✕ 6   6 ✕ 6
                       7   5
                    Cociente   Divisor

              Prueba del Nueve

Compare the two division algorithms below.   Explain that the
numbers in the boxes do not appear in the Spanish form and
that the subtraction is done mentally, immediately after the
products are obtained.

* This 2 is the 2 from the 24.

The 8 is brought
down to make 188.

PART III   (continued)

*This 4 is the 4 from the 48.

<u>PART IV</u>   3-J1-19

Divide the following numbers by using both algorithm forms:

Divide los siguientes números usando los tres métodos:

Ejemplo:

```
                          4 5                      4 5
8 1 4 | 1 8         1 8 | 8 1 4            1 8 | 8 1 4
9 4      4 5              0 9 4                 -7 2
0 4                        0 4                     9 4
                                                 -9 0
                                                    4
```

```
9 8 3 | 2 1         2 1 | 9 8 3            2 1 | 9 8 3
```

```
8 9 1 | 4 8         4 8 | 8 9 1            4 8 | 8 9 1
```

Divide using three different forms. Write the quotient and remainder on the lines provided.

Divide en tres formas distintas los números dados. Escribe el cociente y el residuo en los espacios dados.

	DIVIDENDO	DIVISOR	COCIENTE	RESIDUO
1)	7 5 5	÷ 3 4	_____	_____
2)	8 4 9	÷ 2 7	_____	_____
3)	3 1 6	÷ 5 1	_____	_____
4)	2 7 9	÷ 1 1	_____	_____
5)	9 0 0	÷ 4 6	_____	_____

STRAND   <u>MEASUREMENT</u>   OBJECTIVE CODE   <u>5-J1-3</u>

OBJECTIVE   Perform operations with numbers representing
money values.

SUGGESTED ACTIVITIES

Among Spanish-speaking countries different symbols and/or
abbreviations are used to denominate monetary systems.

<u>PART I</u>

In Spanish-speaking countries the following symbols are used
to represent the UNIT of money: B,B/,¢,¢,G, P or P, L, SB,
S/, $, ₡ , CS.   In Spain the abbreviation <u>Pta</u> is used to indicate
Pesetas, and a comma is used to separate pesetas from céntimos.
In other countries the abbreviation <u>cent</u> is used to indicate
centavos, céntimos, and/or centésimos.
Note: The symbol ₡ is used in El Salvador and in Costa Rica
        to indicate the unit of money; the symbol does not
        refer to cents.

Spanish-Speaking Countries Method		United States Method
1,35Pta	Una Peseta y treinta y cinco céntimos	$1.25
C 3.50	tres Cordobas y cincuenta centavos	One dollar and thirty-five cents.
S/3.50	tres Soles y cincuenta centavos	
3.50p	tres Pesos y cincuenta centavos	
3.50	tres Quetzales y cincuenta centavos	

PART I (continued)   5-J1-3

Monetary Unit		100 Subdivisions		
Name	Symbol	Name	Symbol	Country
BALBOA	B/	Centésimos	Cts	Panama
BOLIVAR	B	Céntimos	C	Venezuela
COLON	¢	Céntimos	Cts	Costa Rica
COLON	¢	Centavos	C	El Salvador
CORDOBA	C$	Centavos	Cts	Nicaragua
ESCUDO	E or E°	Centésimo	C	Chile
ESCUDO	S or Esc	Centavos	Cts	Philippines
GUARANI	G	Céntimos	C	Paraguay
LEMPIRA	L	Centavos	¢	Honduras
PESETA	Pta	Céntimos	Cts	Spain
PESO	$B	Centavos	C	Bolivia
PESO	S or P	Centavos	C	Colombia
PESO	RDS	Centavos	C	Dominican Republic
PESO	P or P	Séntimos or Centavos		Philippines
PESO	$	Centavos	¢	México
QUETZAL	Φ or Q	Centavos	c	Guatemala
SOL	S/ or S/.	Centavos	Cts.	Perú
SUCRE	S/.	Centavos	¢	Ecuador

The basic operations with units of money should be emphasized
by giving special attention to the operations of subtraction
and division.

Daily newspapers may be used by students to find the rate of
exchange for the monetary unit of their native countries.

PART II   5-⊃1-3

Encuentra en el periódico del día el equivalente en dólares
de la unidad monetaria de cada país indicado. Luego ejecuta
las siguientes conversiones:

```
Ejemplo:                   42.12
México:   Peso         22 ⌐926.70     S   42.12      Dólares
$926.70                   46
                         2 7
                           50
                            6
```

(1)   España: Pesetas (Pta)

      185, 55 PTAS   = $ _____ DÓLARES

(2)   Perú: Sol (S/.)
      Ecuador: Sucre (S/.)

      S/. _____   = $ 4 5 3. 45

      S/. _____   = $ 4 5 3. 45

(3)   El Salvador: Colón (¢)

      189.49 ¢   = $ _____ DÓLARES

(4)   Venezuela: Bolivar (B)

      140,357. 15B $ _____

(5)   Honduras: Lempira (L)

      879. 85 L   = $ _____ DÓLARES

      _____ L   = $ 879. 85

(6)   México: Peso ($)

      $ 23,450. 75   = $ _____

      $ _____   = $ 7.50

(7)   Argentina: Peso (S)

      $ 678.23   = $ _____ DÓLARES

PART III   5-JI-3

Help the students to compare the monetary system used in
their respective countries with the system used in the
United States. Compare symbols, the divisions of the
monetary unit, and the way units are separated from cents.

> Note: In some countries the divisions of the
>   unit are smaller than the cent. In
>   Chile, the smallest part is called a
>   milesimo.

Comparison of Symbols

Explain that--

> The symbol for the Peso $
> has only one line written
> over the S.
>
> The symbol for the dollar $
> has two lines written over
> the S.
>
> The symbol for the Sol has   S/.
> a slanted line and a period
> to the right of the S.
>
> The symbol for the cent   cts, c, ¢, cmo
> varies among countries.

Comparison of Coins

> The United States has a 25¢
> coin but not a 20¢ coin.
>
> Mexico has a 20¢ coin but
> not a 25¢ coin.

Comparison of Notation

Some Spanish-speaking countries use a comma to separate
monetary units from decimal parts of the unit.

3,34Pesetas	3.45Ptas
$17,05	$17.05
16,30¢	16.30¢

PART IV   5-J1-3

Use multiplication or division to convert the following amounts
of money from one monetary system to another.

Usa el proceso algorítmico de multiplicación y de división según
se usa en los Estados Unidos para convertir las siguientes
cantidades monetarias de un sistema a otro:

1)   146.80 L   = $ _____ (dólares)

2) $B 39.45   = $ _____ (dólares)

3) $46.75   = $ _____ (Pesos mexicanos)

4)   S/. 49,580.00   = $ _____ (dólares)

5)   ₡ 1,895.75   = $ _____ (dólares)

6)   3956,40 Pta   = $ _____ (dólares)

7)   1,595.50 ₡   = $ _____ (dólares)

8) $145.50   =   SB_____ (Pesos bolivianos)

9) $568.50   =   ₡ _____ (Colones, Salvador)

10) $375.50   =   ₡ _____ (Colones, Costa Rica)

GRADE 5

Place Value

2-K1-1   Read and write eight-digit numerals.

2-K1-3   Write numerals in expanded notation, including eight places.

Operations with Whole Numbers

3-K1-2   Subtract whole numbers, five digits or more, with regrouping.

3-K1-6   Find the quotient of a five-digit dividend (or less) and a two-digit divisor.

3-K1-7   Estimate the quotient of a dividend of five digits or less and a two-digit divisor.

Rational Numbers

4-K1-7   Subtract rational numbers with like denominators, with regrouping.

4-K2-3   Subtract two rational numbers with unlike denominators.

4-K2-5   Subtract mixed numerals, including regrouping.

4-K3-5   Subtract rational numbers with unlike denominators, grouping required.

4-K3-6   Read and write a three-place decimal.

STRAND   <u>PLACE VALUE</u>   **OBJECTIVE CODE**   <u>2-K1-1</u>

OBJECTIVE   Read and write eight-digit numerals.

SUGGESTED ACTIVITIES

In some Spanish-speaking countries, such as Spain, points are
used in lieu of commas in dividing each group of three digits
in a numeral (1.000 = 1,000). The names of the groupings vary.
In the United States, a three-place grouping is called a period;
in Spanish-speaking countries, a three-place grouping is called
a class and two classes form a period.

<u>PART I</u>

Spanish-Speaking
<u>Countries Method</u>

Segundo Período						Primer Período					
Cuarta Clase Millares de Millón			Tercera Clase Millones			Segunda Clase Millares			Primera Clase Unidades		
12°	11°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°
o	r	d e n	o	r	d e n	o	r	d e n	o	r	d e n
Centenas de Millares de Millón	Decenas de Millares de Millón	Unidades de Millares de Millón	Centenas de Millón	Decenas de Millón	Unidades de Millón	Centenas de Millar	Decenas de Millar	Unidades de Millar	Centenas Simples	Decenas Simples	Unidades Simples
				8	7	5	1	4	2	6	3

PART I (continued)   2-K1-1

In some countries, such as Spain, the numeral is written with points in place of commas.

Example: 87.514.963

In some countries, such as Peru, the numeral is written with exponents 1, 2, 3 ... to denote millions, billions, trillions... respectively.

Example: $87\overset{1}{,}514,963$

When writing numerals with words --

  The thousands are written in the singular form
  (2,000 = dos mil) but hundreds and millions in
  the plural form (200 = doscientos; 3,000,000 =
  tres millones).

  Words used to name numbers greater than or
  equal to 200 are formed by using the name of
  the place (ciento) after the name of the digit.
  For example, 200 is doscientos and 300 is trescientos.

  The following are exceptions to the procedure
  described above:

      500   =   quinientos

      700   =   setecientos

      900   =   novecientos.

The number 87,514,963 is written as--ochenta y siete millones, quinientos catorce mil, novecientos veintitres.

United States Method

Third Period   Second Period   First Period

Millions		Thousands			Ones		
Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Units
8	7,	5	1	4,	9	6	3

PART II   2-K1-1

Escribe los números en el lugar correcto para indicar el valor
relativo de cada cifra. También escribe los números con letra.

Número	Valor Relativo de los Números								
	Decenas de Millón	Unidades de Millón	Centenas de Millar	Decenas de Millar	Unidades de Millar	Centenas Simples	Decenas Simples	Unidades Simples	
42 648 912	4	2	6	4	8	9	1	2	
	Cuarenta y dos millones, seiscientos cuarenta y ocho mil novecientos doce								
64 169 462									
91 523 193									
8 410 277									
61 079									
18 010 498									
79 832 100									

PART III   2-K1-1

Review Spanish terms for place values and then teach the English terms such as:

unidades   ----▶   units (ones)

Review the term for place value groupings and then teach the United States terminology --

1 clase   (for 3 places) ----▶   units to hundreds...

1 período (for 6 places)   ----▶   units to thousands...

If necessary, review the reason for place value division markings and teach the use of commas --

1.000   (mil)   ----▶   1,000   (thousand)

Review the rules for writing numerals with words and then teach the translation --

dos ----▶ two   catorce ----▶ fourteen

Point out that hundreds, thousands, and millions are written as singular in English--

doscientos   ----▶   two hundred

dos mil   ----▶   two thousand

dos millones   ----▶   two million

PART IV   2-K1-1

Use the correct punctuation and write the numbers in words:

Usa la puntuación correcta y escribe los siguientes números
en palabras:

Spanish-Speaking Countries Method	United States Method
1) 64 162 942	1) 64 162 942
2) 19 123 456	2) 91 765 320
3) 10 000 020	3) 12 000 060

Write the digits for the following numerals:

Escribe las cifras para los números siguientes:

(1) cuarenta y tres millones,   (1) twenty-four million,
    ochocientos dieciocho mil,   three hundred seventy-six
    setecientos sesenta y ocho   thousand, four hundred
                                        fifty-one

_____   _____

(2) treinta y tres millones,   (2) fifty-nine million, two
    cuatrocientos noventa y dos   hundred forty-three
    mil, seiscientos veinticinco   thousand, six hundred
                                        seventy-nine

_____   _____

STRAND <u>PLACE VALUE</u>   OBJECTIVE CODE   <u>2-K1-3</u>

OBJECTIVE Write numerals in expanded notation, including
eight places.

SUGGESTED ACTIVITIES

In most Spanish-speaking countries a vertical arrangement is
used to show a number in expanded notation. In the United States
a horizontal arrangement is used. Also, in some Spanish-speaking
countries an index is used to denote millions ($5\overset{1}{,}000,000$ =
5,000,000). In some Spanish-speaking countries a point is used
in place of the comma (1.000 = 1,000).

<u>PART I</u>

Write, $82\overset{1}{,}654,217$ in expanded form.

Spanish-Speaking Countries Method	United States Method
$80\overset{1}{,}000,000$	80,000,000 + 2,000,000 + 600,000 +
$2\overset{1}{,}000,000$	50,000 + 4,000 + 200 + 10 + 7 =
600,000	82,654,217
50,000	
4,000	
200	
10	
7	
$82\overset{1}{,}654,217$	

In some Spanish-speaking countries the students are instructed
to write a small index <u>1</u>, <u>2</u>,... to single out the millions in
the seventh place, the billions in the thirteenth place...
respectively.

PART II   2-K1-3

Marca las clases y los períodos y escríbelos en notación
desarrollada.

1)   42 619 411   5)   16 700 412

2)   17 416   6)   272 419

3)   6 425 698   7)   72 454 321

4)   6 942 333   8)   91 543 298

PART III   2-K1-3

Relate the place value terms in Spanish to the English terms.

unidades $\longrightarrow$ units (ones)

decenas $\longrightarrow$ tens

centenas $\longrightarrow$ hundreds

unidades de millar $\longrightarrow$ thousands

decenas de millar $\longrightarrow$ ten thousands

centenas de millar $\longrightarrow$ hundred thousands

unidades de millón $\longrightarrow$ millions

decenas de millón $\longrightarrow$ ten millions

If necessary, review the use of the index in the millions-place.
Point out that the index is not used in the United States.

$$2^1000,000 = 2,000,000$$

Review the reason for using marks to group the digits. Stress
the use of commas instead of periods in the United States method.

$$1.000 = 1,000$$

Review the format for number expansion that is used in the
Spanish-speaking countries. Then teach the horizontal format
used in the United States.

40,000,000

2,000,000

500,000   40,000,000 + 2,000,000 + 500,000

30,000   + 30,000 + 7,000 + 900 + 60 + 1

7,000   =   42,537,961

900

60

+ _____1   Copyright © 1982 Board of Education of the City of Chicago, Chicago, Illinois

42,537,961   47

PART IV   48   2-K1-3

Write numbers in expanded notation. Use both vertical and horizontal forms.

Escribe los siguientes números en notación desarrollada en la forma vertical y horizontal.

Spanish-Speaking Countries Method		United States Method	
1)	9,142,029	5)	13,998,417
2)	4,828,949	6)	29,384
3)	27,179,144	7)	100,654
4)	75,397,208	8)	98,402,634

STRAND <u>OPERATIONS WITH WHOLE NUMBERS</u>   OBJECTIVE CODE   <u>3-K1-2</u>

OBJECTIVE   Subtract whole numbers, five digits or more, with regrouping.

SUGGESTED ACTIVITIES

In the subtraction process used in the Spanish-speaking countries, the subtrahend is increased mentally by one instead of renaming the minuend.

<u>PART I</u>

<u>Spanish-Speaking Countries Method</u>	<u>United States Method</u>

<u>ONES AND TENS PLACES</u>

$$
\begin{array}{r}
4\,3,\;6\,7^{1}\!\!/\!5 \\
-1\,2,\;6_{1}6 \\
\hline
3\,1,\;1\,0\,9
\end{array}
\qquad
\begin{array}{r}
{}^{6}\\
4\,3\,6\,7^{1}5 \\
-1\,2\,5\,6\,6 \\
\hline
3\,1,\;1\,0\,9
\end{array}
$$

The steps in the process are as follows:

Borrow 1 ten from 7 tens to make 10 ones. Add the 10 ones to the 5 ones to make 15 ones.	Rename the 7 tens as 6 tens and ten ones. Add the 10 ones to the 5 ones to form 15 ones.
Say: 15 minus 6 is 9.	Say: 15 minus 6 is 9.
Add the 1 ten borrowed to the 6 tens in the subtrahend to form 7 tens.	

PART I (continued)   3-K1-2

Spanish-Speaking   United States
Countries Method   Method

ONES AND TENS PLACES

$$4\ 2,3\ 3^1_|6$$
$$3\ 5,4\ 6^{\downarrow}_|8$$
$$\overline{\qquad\quad 8}$$

                                          $$\qquad\qquad 2$$
$$4\ 2,3\ \not{3}^16$$
$$-\ 3\ 5,4\ 6\ 8$$
$$\overline{\qquad\qquad 8}$$

Analyze this process by studying the example given on the
preceding page.

TENS AND HUNDREDS PLACES

$$4\ 2,3^1_|3^16$$
$$3\ 5,4^{\downarrow}_16_18$$
$$\overline{\qquad 6\ 8}$$

                                          $$\qquad\qquad 2^12$$
$$4\ 2\ \not{3}\ \not{3}^16$$
$$-\ 3\ 5\ 4\ 6\ 8$$
$$\overline{\qquad\quad 6\ 8}$$

Find the number for the tens place by repeating the steps
used in the ones place.

HUNDREDS AND THOUSANDS PLACES

                                          $$\qquad\quad {}^1_1{}^1_2{}^1_2$$
$$4^1_2^1_|3^1_3^16$$
$$3_1\not{5}_14_16_18$$
$$\overline{\quad 6,8\ 6\ 8}$$

                                          $$4\ \not{2}\ \not{3}\ \not{3}^16$$
$$3\ 5,4\ 6\ 8$$
$$\overline{\qquad 6,8\ 6\ 8}$$

Repeat the steps above for each of the places, until all
of the places have been subtracted.

PART II   3-Kl-2

Revisa la lectura y escritura de números de cinco cifras.
Presente problemas escritos para que los alumnos averigüen
la operacíon necesaria para resolverlos.

¿Cuál es la diferencia entre cada uno de los siguientes
números?

a. 35,806   Diferencia entre

b. 17,492   a y b _____

c. 29,957   a y c _____

d. 55,376   a y d _____

e. 23,094   a y e _____

Diferencia entre   Diferencia entre

b y c = _____   c y d = _____

b y d = _____   c y e = _____

d y e = _____   d y e = _____

b y b = _____   c y a = _____

PART III   3-K1-2

Explain the subtraction method used in the United States.
Compare it with the method used in Spanish-speaking countries.

Example:

Spanish-Speaking   United States
Countries Method   Method

$2^14^12^12^16$ $1^13^11^11$
                                    $\cancel{2}\,\cancel{4}\,\cancel{2}\,\cancel{2}^16$
1 9 8 7 9   1 9 8 7 9
____1_1_1_1___   _____
0 4 3 4 7   0 4 3 4 7

Borrow 1 ten from 2 tens.   Rename the 2 tens as
to make 10 ones.   1 ten and 10 ones. Add
Add the 10 ones to the   the 10 ones to the 6 ones
6 ones to make 16 ones.   to make 16 ones.
Think: 16 - 9 = 7
Write 7 under the line,   Say: 16 - 9 is 7.
below the 9.   Write 7 under the line.
Return the 1 borrowed to
the tens place of the   Repeat the process by
subtrahend to make 8 tens.   renaming the digit in the
Repeat the borrowing   hundreds place...
and returning from
minuend to subtrahend
as needed.

Place the following problem on the chalkboard:

          2 5 3 2 7
        - 1 8 7 2 9
        _____

Ask questions that will lead the students to an understanding
of the differences in the two methods.

PART IV   3-K1-2

Subtract these numbers:

Reste los siguientes números:

Spanish-Speaking Countries Method	United States Method
3 2 1 6 4	3 2 1 6 4
-1 7 8 6 5	- 1 7 8 6 5

| 1 3 9 7 6 | 1 3 9 7 6 |
| - 1 2 9 8 7 | - 1 2 9 8 7 |

| 2 5 6 0 4 | 2 5 6 0 4 |
| - 8 7 9 6 | - 8 7 9 6 |

| 1 6 3 4 1 1 | 1 6 3 4 1 1 |
| - 9 8 7 6 5 | - 9 8 7 6 5 |

STRAND <u>OPERATIONS WITH WHOLE NUMBERS</u> OBJECTIVE CODE <u>3-K1-6</u>

OBJECTIVE Find the quotient of a five-digit dividend (or less) and a two-digit divisor.

SUGGESTED ACTIVITIES

The division algorithm in the Spanish-speaking countries follows a process different from the one used in the United States.

<u>PART I</u>

<u>Spanish-Speaking Countries Method</u>   <u>United States Method</u>

These symbols are used:

$\div$, $\lfloor\quad\rfloor$, or $\lceil\quad$

The dividend is written to the left of the symbol.

23451 $\div$ 24

The divisor is written to the right of the symbol.

The subtraction is done mentally. The partial products of divisor times quotient do not appear in the algorithm. Only the remainders are shown below the digits that were divided.

PART I (continued)   3-K1-6

Analyze the steps of the division algorithm as it is done in the Spanish-speaking countries.

Think: 32 goes into 135 as 3 goes into 13, -- four times.

Now multiply: 4 x 2 = 8,
Think: 15 - 8 = 7.
Write 7 below the 5.

Now multiply: 4 x 3 = 12.
Add the 1 from the 15; 12 + 1 = 13.
Subtract 13 from 13.
Write 0 as a remainder under the 13.

Follow the steps above for each of the digits of the quotient.

The inverse operation of division or the cast-out-nines method
is used to check a division problem.

```
1 5 3 4 8 | 4 5            3 4 1      Quotient
  1 8 4      3 4·1        X   4 5      Divisor
    0 4 8                  1 7 0 5
      0 3        8        1 3 6 4
              3 X 3       1 5 3 4 5    Product
                 9      +       3      Remainder
             Divisor        1 5 3 4 8  Dividend
              4 + 5
```

The cast-out method uses the principle of addition of the digits
of the divisor, dividend, quotient, and remainder, if any. The
nines or digits whose sum is nine are deleted from each of the
sums. If a two-digit number is obtained in any of the four sums,
the digits are added again until a one-digit number is obtained.
The sums are placed around a figure X.

Example:

```
       5 1 1                  7              5 + 1 + 1 = (7)
 1 7 | 8 6 9 7      8       3 X 3
       0 1 9      + 6          8            7 X 8 = 56
         2 7       7                          56 + 10 = 66
         1 0      21                        6 + 6 = 12
                  2 + 1                       1 + 2 = (3)
 1 + 7 = (8)
```

The sum of the digits of the divisor 17 is 8 (1 + 7 = 8). The
8 is written in the bottom part of the X.

The sum of the digits of the quotient 511 is 7 (5 + 1 + 1 = 7).
The 7 is written in the top part of the X.

The sum of the digits of the dividend 8697 is 21 (8 + 6 + 7 = 21).
The sum of the digits of 21 is 3 (2 + 1 = 3). The 3 is written
in the left part of the X.
The product of 7 and 8 in the X is 56.

The sum of the product 56 and the remainder 10 is 66.
The sum of the digits of 66 is 12; the sum of the digits of 12 is 3.
The 3 is written in the right part of the X. The digits in the
left and right parts of the X are compared. If they are identical,
the algorithm is correct.

Part II   3-K1-6

Sigue el ejemplo dado. Encuentra el cociente de los siguientes
números y comprueba los resultados usando la prueba del nueve:

1)   7 6,5 9 2 | 4 2   3)   7 6 | 1 1,2 2 9

2)   9 9,5 6 7 | 8 9   4)   2 3 | 7 5,2 9 0

Ejemplo:

5 4 3 7 6 | 6 2
   4 7 7   8 7 7
      4 3 6
        0 2

                        Cociente
                        8 + 7 + 7 = 22
                              2 + 2 = 4
                                          Producto
Dividendo   4   más residuo

5 + 4 + 3 + 7 + 6 = 25   7 ╳ 7   4 X 8 = 32
      2 + 5 = 7   32 + 2 = 34
                            8   3 + 4 = 7

                        Divisor
                        6 + 2 = 8

PART III   3-K1-6

Facilitate the students' transition from one algorithm form to the other form, Figure A to Figure C, by using Figure B as an in-between step.   See illustration below.

Note: Figure A shows the division algorithm used more frequently in the Spanish-speaking countries.

Figure B shows an in-between step.   This form is also used in some Spanish-speaking countries. Students who have mastered form A must go to form B before making the transition to form C.

Figure C is the form used in the United States for the division algorithm.

Neither Figure A nor B shows the partial products. The subtraction is done by mentally subtracting the numbers as the products are obtained from the multiplication.

FIGURE A

```
  1  2, 5  0  0 | 1 4
     1  3  0          8 9 2
        0  4  0
           1  2
```

FIGURE B   FIGURE C   8 9 2

```
        8  9  2                          1 4 | 1 2,5  0  0
  1 4 | 1 2,5  0  0                         -1 1 2
        1  3  0  ----------------------->   1 3  0
        0  4  0  ----------------------     -1 2 6
           1  2  --                 -----> 0 4 0
                                           -  2 8
                                              1 2
```

PART IV   3-K1-6

Divide the following numbers using both division algorithm forms:

Divide los siguientes números usando las dos formas:

Spanish-Speaking   United States
Countries Method   Method

1)   4 1,5 9 6 | 18   6)   2 3 | 4 1,5 9 6

2)   3 0,5 8 7 | 5 2   7)   5 6 | 5 5,0 9 4

3)   1,4 5 7 | 1 2   8)   1 2 | 2 0,5 7 9

4)   7 5,4 1 0 | 8 4   9)   8 4 | 7 5,4 1 0

5)   1 0,0 8 7 | 2 5   10)   2 9 | 4 0,0 7 1

STRAND OPERATIONS WITH WHOLE NUMBERS OBJECTIVE CODE 3-K1-7

OBJECTIVE Estimate the quotient of a dividend of five digits or less and a two-digit divisor.

SUGGESTED ACTIVITIES

In Spanish-speaking countries the estimation is done by counting the number of digits in the dividend to determine the number of digits in the quotient instead of by doing the division algorithm.

PART I

Spanish-Speaking   United States
Countries Method   Method
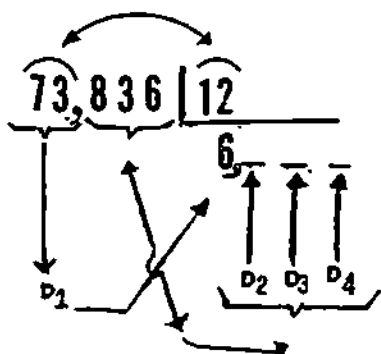
United States Method:

$$73 \overline{\smash{)}430} \quad 5 \text{ R } 65$$

Rounding 73 to 70
gives an estimate of 6
which makes $73 \times 6 > 430$.

$\square \times 70 \leq 430$

$6 \times 70 \leq 430$

$6 \times 73 = 438$

The number of digits in the dividend and in the divisor are counted. An attempt is made to divide the divisor into the first digit of the dividend. If the division is not possible, the divisor is divided into the first two digits, the first three digits...of the dividend until the division process is possible. When the division is possible, the first digit of the quotient is obtained and the number of digits in the quotient is determined by counting the digits to the right as a digit 2, digit 3.... In the example above, the quotient is between 6,000 and 6,999 because it is a four-digit number.

PART II   3-K1-7

Estima los cocientes.   Indica la primera cifra.

1)   10,585 | 15

5)   19,219 | 33

2)   19,204 | 11

6)   49,108 | 11

3)   13,933 | 13

7)   11,538 | 25

4)   58,103 | 12

8)   20,253 | 22

El cociente del problema número 1) tiene _____ cifras.

El cociente del problema número 2) tiene _____ cifras.

El cociente del problema número 3) es mayor que _____.

El cociente del problema número 4) es mayor que _____.

El cociente del problema número 5) es mayor que _____.

El cociente del problema número 6) es mayor que _____.

El cociente del problema número 7) es mayor que _____.

El cociente del problema número 8) es mayor que _____.

PART III   3-K1-7

Review the Spanish terms and guide the students in drawing
the division symbols.

Spanish-Speaking Countries Method	United States Method

dividendo | divisor   divisor | dividend
 residuos   cociente   products

quotient ← (arrow from cociente)
remainders ← (arrow from residuos)

Have the students write the dividend outside and to the left side of the right angle and the divisor inside the angle.	Explain that in the United States the divisor is written outside and to the left of the right angle and the dividend inside the angle. Point out that the angle opens downward.

When solving problems with the students, be sure that they place
each digit of the quotient in its proper place. Tell them to
wirte 0 (zero) if the remainder is zero.

PART IV   3-K1-7

Compare both ways. Write the number of digits needed in
the quotient.

Compara ambas formas luego escribe el número de dígitos
necesarios en el cociente.

$$19,348 \,\underline{\big\lfloor 12}$$ (four digits) $$12 \,\overline{\big)19,834}$$ (four digits)
            XXXX   X XXX

1) $$40,017 \,\underline{\big\lfloor 16}$$ _____   2) $$16 \,\overline{\big)34,701}$$ _____

3) $$67,248 \,\underline{\big\lfloor 23}$$ _____   4) $$23 \,\overline{\big)16,824}$$ _____

5) $$12,006 \,\underline{\big\lfloor 14}$$ _____   6) $$14 \,\overline{\big)11,600}$$ _____

STRAND <u>RATIONAL NUMBERS</u>   OBJECTIVE CODE   <u>4-K1-7</u>

OBJECTIVE Subtract rational numbers with like denominators,
with regrouping.

SUGGESTED ACTIVITIES

In Spanish-speaking countries subtracting mixed numerals
is done by converting them to improper fractions and then
subtracting. This process is carried out horizontally.

<u>PART I</u>

Spanish-Speaking Countries Method	United States Method
$2\dfrac{1}{4} - 1\dfrac{3}{4} =$	$2\dfrac{1}{4} - 1\dfrac{3}{4} =$
$\dfrac{9}{4} - \dfrac{7}{4} =$	$2\dfrac{1}{4} = 1\dfrac{5}{4}$
$\dfrac{9-7}{4} =$	$-1\dfrac{3}{4} = 1\dfrac{3}{4}$
$\dfrac{\overset{1}{\cancel{2}}}{\underset{2}{\cancel{4}}} = \dfrac{1}{2}$	$0\dfrac{2}{4} = \dfrac{1}{2}$

In order to subtract mixed
numerals, it is necesary
to convert them to im-
proper fractions.

If renaming a whole number
is required in order to
subtract mixed numerals,
the mixed numerals are
regrouped as illustrated
above.

PART I (continued)   4-K1-7

Step 1

$$2\frac{1}{4} = \frac{(2 \times 4) + 1}{4} = \frac{9}{4}$$

The mixed numeral is converted to an improper fraction by multiplying the whole number by the denominator and then adding the numerator to the product. The denominator is common to both fractions.

Step 2

$$1\frac{3}{4} = \frac{(1 \times 4) + 3}{4} = \frac{7}{4}$$

The second mixed numeral is converted by proceeding in the same manner as explained above.

Step 3

$$\frac{9}{4} - \frac{7}{4} = \frac{2}{4}$$

The second fraction is subtracted from the first fraction.

$$\frac{9 - 7}{4} = \frac{2}{4}$$

Step 4

$$\frac{\cancel{2}^{1}}{\cancel{4}_{2}} = \frac{1}{2}$$

The fraction is renamed in simplest form.

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Encuentra la diferencia v exprésala en la forma más simple.

1) $8 \frac{4}{8} - 4 \frac{7}{8} =$

6) $4 \frac{1}{4} - 3 \frac{3}{4} =$

2) $2 \frac{3}{7} - 1 \frac{5}{7} =$

7) $3 \frac{2}{6} - 1 \frac{5}{6} =$

3) $1 \frac{7}{9} - \frac{8}{9} =$

8) $5 \frac{3}{5} - 2 \frac{4}{5} =$

4) $2 \frac{2}{3} - 2 \frac{1}{3} =$

9) $7 \frac{1}{4} - 3 \frac{3}{4} =$

5) $1 \frac{2}{9} - \frac{5}{9} =$

10) $6 \frac{5}{7} - 4 \frac{6}{7} =$

PART III

Write a subtraction problem on the chalkboard. Have the students explain both methods of subtracting fractions. Analyze the differences in position and process.

Spanish-Speaking Countries Method	United States Method

$$6\frac{1}{8} - 4\frac{7}{8} =$$

$$6\frac{1}{8} = 5\frac{9}{8}$$

$$\frac{49 - 39}{8} = \frac{10}{8} =$$

$$-4\frac{7}{8} = 4\frac{7}{8}$$

$$1\frac{2}{8} = 1\frac{1}{4}$$

$$1\frac{2}{8} = 1\frac{1}{4}$$

PART IV   4-K1-7

Subtract the following numbers and express each difference in
the simplest form:

Resta las siguientes fracciones y reduce a la mínima expresíon:

1) $2\frac{2}{5} - 1\frac{3}{5} =$ 6) $3\frac{3}{7} - 2\frac{5}{7} =$

2) $3\frac{2}{6} - 2\frac{5}{6} =$ 7) $2\frac{3}{8} - 1\frac{7}{8} =$

3) $4\frac{1}{6} - 2\frac{2}{6} =$ 8) $3\frac{3}{7} - 2\frac{4}{7} =$

4) $4\frac{3}{8} - \frac{7}{8} =$ 9) $1\frac{4}{9} - \frac{8}{9} =$

5) $5\frac{2}{6} - \frac{5}{6} = =$ 10) $7\frac{1}{3} - 5\frac{2}{3} =$

STRAND   RATIONAL NUMBERS   OBJECTIVE CODE   4-K2-3

OBJECTIVE   Subtract two rational numbers with unlike denominators.

SUGGESTED ACTIVITIES

To subtract fractions with unlike denominators, the minuend and the subtrahend are written horizontally instead of vertically.   The rational numbers are converted to improper fractions in the Spanish-speaking countries.

PART I

Spanish-Speaking
Countries Method

United States
Method

$$\frac{5}{8} - \frac{3}{5} = \frac{25}{40} - \frac{24}{40}$$

$$\frac{5}{8} = \frac{25}{40}$$

$$= \frac{25 - 24}{40} = \frac{1}{40}$$

$$- \frac{3}{5} = \frac{24}{40}$$

$$\frac{1}{40}$$

$$\frac{7}{8} - \frac{5}{12} = \frac{21}{24} - \frac{10}{24}$$

$$\frac{7}{8} = \frac{21}{24}$$

$$= \frac{21 - 10}{24} = \frac{11}{24}$$

$$- \frac{5}{12} = \frac{10}{24}$$

$$\frac{11}{24}$$

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Students are required to simplify the fractions to the
lowest terms when possible by dividing numerator and
denominator by the largest factor.

Example:

$$\frac{2}{4} - \frac{3}{9} = \frac{1}{2} - \frac{1}{3}$$

The factor two is the
divisor for the first
fraction and the factor
three is the divisor
for the second fraction.

$$= \frac{3 - 2}{6} = \frac{1}{6}$$

When denominators do ɴ̣ have a common factor, the unlike
denominators are multiplied to find the least common denominator.

$$\frac{5}{6} - \frac{2}{5} = \frac{25}{30} - \frac{12}{30} =$$

The unlike denominators
are multiplied.

$$6 \times 5 = 30$$

$$= \frac{25 - 12}{30} = \frac{13}{30}$$

When unlike denominators have a factor in common, the following
process is used:

$$\frac{7}{8} - \frac{7}{12} =$$

The denominators are placed
side by side.
The lowest common factor is
written at the right of the
line.

$$\frac{21}{24} - \frac{14}{24} =$$

The quotients are written
below the numbers.
Another factor is used until
all common factors are at
the right of the line.
All the prime numbers are
multiplied. $2 \times 3 \times 2 \times 2 = 24$

$$\frac{21 - 14}{24} =$$

$$\frac{7}{24}$$

8	12	2
4	6	2	x
2	3	x

PART II   <u>4-K2-3</u>

Resta las siguiéntes fracciones. Reduce si es posible,
las fracciones a su expresión mínima antes de restar.

Ejemplo:

$$\frac{4}{6} - \frac{7}{14} = \frac{2}{3} - \frac{1}{2} = \frac{4 - 3}{6} = \frac{1}{6}$$

1) $1\frac{9}{12} - \frac{3}{5} =$

2) $2\frac{10}{12} - \frac{10}{16} =$

3) $1\frac{7}{9} - \frac{3}{7} =$

4) $1\frac{25}{30} - \frac{1}{3} =$

PART III   4-K2-3

After students have mastered the subtraction of rational
numbers with unlike denominators, facilitate the transition
to the method used in the United States as follows:

Spanish-Speaking Countries Method	United States Method

Example:

$$1 \frac{3}{4} - \frac{2}{3} =$$ $$1 \frac{3}{4} = 1 \frac{9}{12}$$

Convert the mixed
numeral to an
improper fraction.

$$-\frac{2}{3} = -\frac{8}{12}$$

$$\frac{7}{4} - \frac{2}{3} =$$ $$1 \frac{1}{12}$$

Find a common
denominator.

$$\frac{21}{12} = \frac{8}{12}$$

$$= \frac{21 - 8}{12} = \frac{13}{12}$$

$$= 1 \frac{1}{12}$$

PART IV   4-K2-3

Subtract the fractions with unlike denominators. Use
both methods.

Resta estas fracciones de diferente denominador. Usa
ambos métodos.

Spanish-Speaking   United States
Countries Method   Method

1) $\dfrac{14}{16} - \dfrac{2}{3} =$ 1) $\dfrac{14}{16}$

                                              $-\ \dfrac{2}{3}$

                                              _____

2) $\dfrac{9}{12} - \dfrac{3}{5} =$ 2) $\dfrac{9}{12}$

                                              $-\ \dfrac{3}{5}$

                                              _____

3) $\dfrac{8}{9} - \dfrac{2}{5} =$ 3) $\dfrac{8}{9}$

                                              $-\ \dfrac{2}{5}$

                                              _____

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OBJECTIVE   Subtract mixed numerals, including regrouping.

SUGGESTED ACTIVITIES

Subtraction of mixed numerals is accomplished in Spanish-speaking countries in a manner different from the United States method.

PART I

The main differences are as follows:

The subtraction is done horizontally not vertically.

The mixed numerals are converted to improper fractions.

Spanish-Speaking
Countries Method

United States
Method

$$3\frac{1}{8} \;-\; 2\frac{3}{4} =$$

Minuend Subtrahend

$$\frac{25}{8} - \frac{11}{4} =$$

$$\frac{25 - 22}{8} = \frac{3}{8}$$

$$3\frac{1}{8} \longrightarrow 2\frac{9}{8}$$

$$- 2\frac{3}{4} \longrightarrow 2\frac{6}{8}$$

$$\frac{3}{8}$$

PART II   4-K2-5

Haz los siguientes ejercicios:

Ejemplo:

$$3\frac{1}{8} - 2\frac{3}{4} = \frac{25}{8} - \frac{11}{4}$$

$$= \frac{25 - 22}{8} = \frac{3}{8}$$

1) $8\frac{1}{8} - 6\frac{2}{16} =$

2) $19\frac{2}{4} - 10\frac{1}{12} =$

3) $18\frac{2}{5} - 4\frac{2}{10} =$

4) $6\frac{2}{3} - 3\frac{11}{18} =$

5) $8\frac{1}{20} - 6\frac{1}{4} =$

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After students have mastered the Spanish-speaking method of
subtracting mixed numerals, emphasize that the main difference
is in regrouping.

Spanish-Speaking Countries Method	United States Method

$$3\frac{1}{8} \longrightarrow \frac{25}{8} \qquad\qquad 3\frac{1}{8} \longrightarrow 2\frac{9}{8}$$

Explain that $3\frac{1}{8}$ is changed
to $\frac{25}{8}$ by multiplying $\frac{8}{8} \times 3$
and adding $\frac{1}{8}$ to the product.

Explain that $3\frac{1}{8}$ is changed
to $2\frac{9}{8}$ by renaming one whole
as $\frac{8}{8}$ and adding it to $\frac{1}{8}$.

$$2\frac{3}{4} \longrightarrow \frac{11}{4} \qquad\qquad 2\frac{3}{4} \longrightarrow 2\frac{6}{8}$$

Show that $2\frac{3}{4}$ is changed to
$\frac{11}{4}$ by multiplying $\frac{4}{4} \times 2$ and
adding $\frac{3}{4}$ to the product.

Show that $2\frac{3}{4}$ is changed to
$2\frac{6}{8}$ by finding an equivalent
fraction of $\frac{3}{4}$ with the same
denominator as the other fraction.

$$\frac{25}{8} - \frac{11}{4}$$

In order to subtract, both
fractions must have the same
denominator.

$$3\frac{1}{8} = 3\frac{1}{8} = 2\frac{9}{8}$$
$$-2\frac{3}{4} = 2\frac{6}{8} = 2\frac{6}{8}$$
$$\overline{\qquad\qquad \frac{3}{8}}$$

$$\frac{25 - \overset{(11 \times 2)}{22}}{8} = \frac{3}{8}$$

PART IV   4-K2-5

Solve the following problems by using both methods:

Resuelve los problemas usando ambos metodos:

	Spanish-Speaking Countries Method	United States Method

1) $5\frac{1}{5} - 3\frac{1}{15} =$

2) $2\frac{1}{4} - 1\frac{1}{12} =$

3) $8\frac{1}{6} - 6\frac{1}{12} =$

4) $15\frac{1}{2} - 8\frac{1}{4} =$

5) $18\frac{1}{2} - 2\frac{1}{3} =$

STRAND   <u>RATIONAL NUMBERS</u>   OBJECTIVE CODE   <u>4-K3-5</u>

OBJECTIVE   Subtract rational numbers with unlike
denominators, grouping required.

SUGGESTED ACTIVITIES

In Spanish-speaking countries the most common way to subtract
fractions is to write them horizontally. The method used
changes mixed numerals to improper fractions.

<u>PART I</u>

<u>Spanish-Speaking
Countries Method</u>

<u>United States
Method</u>

$$6\frac{1}{4} - 4\frac{7}{8} =$$

$$6\frac{1}{4} = 6\frac{2}{8} = 5\frac{10}{8}$$

$$\frac{25}{4} - \frac{39}{8} =$$

$$-\ 4\frac{7}{8} = 4\frac{7}{8} = 4\ \frac{7}{8}$$

$$\frac{50 - 39}{8} = \frac{11}{8} = 1\frac{3}{8}$$

$$1\ \frac{3}{8}$$

$$6 - 3\frac{2}{3} =$$

$$6\ \ = \ \ 5\frac{3}{3}$$

$$\frac{18}{3} - \frac{11}{3} =$$

$$-\ \ 3\frac{2}{3} = \ \ 3\frac{2}{3}$$

$$2\frac{1}{3}$$

$$\frac{18 - 11}{3} = \frac{7}{3} = 2\frac{1}{3}$$

PART I (continued)   4-K3-5

Spanish-Speaking   United States
Countries Method   Method

$$\frac{3}{4} - \frac{2}{5} =$$ $$\frac{3}{4} = \frac{15}{20}$$

$$\frac{15 - 8}{20} = \frac{7}{20}$$ $$- \frac{2}{5} = \frac{8}{20}$$

$$\frac{7}{20}$$

$$\frac{3}{4} - \frac{3}{10} =$$ $$\frac{3}{4} = \frac{15}{20}$$

$$\frac{15 - 6}{20} = \frac{9}{20}$$ $$- \frac{3}{10} = \frac{6}{20}$$

$$\frac{9}{20}$$

<u>PART II</u>

Resuelve estos problemas.   Convierte los números mixtos a fracciones impropias.

1) $7 \dfrac{1}{4} - 2 \dfrac{9}{12} =$

2) $30 \dfrac{1}{4} - 24 \dfrac{7}{6} =$

Resuelve estos problemas restando los números enteros de los números enteros, y las fracciones de las fracciones.

3) $5 \dfrac{2}{3} - 2 \dfrac{1}{4} =$

4) $24 \dfrac{2}{3} - 16 \dfrac{2}{5} =$

Resuelve estos problemas cambiando el entero a número racional y el número mixto a fracción impropia.   Encuentra el mínimo común denominador.

5) $5 - 3 \dfrac{1}{6} =$

6) $7 - 2 \dfrac{2}{4} =$

Resta.

7) $1 \dfrac{2}{3} - \dfrac{4}{8} =$ 9) $6 - 1 \dfrac{3}{5} =$

9) $2 \dfrac{6}{7} - 3 \dfrac{1}{2} =$ 10) $7 \dfrac{3}{4} - 6 =$

PART III   **4-K3-5**

Permit the students to learn their own method correctly.
Make comparisons between both methods. Identify the minuend
and the subtrahend in each problem.

Discuss the functions of each part of a problem. Focus
students' attention on the final answer.

Perform subtraction operations. Use both methods.

Spanish-Speaking   United States
Countries Method   Method

1) $\quad 3\frac{1}{8} - 2\frac{1}{4} =$

        Este es el
        sustraendo.

Este es el
minuendo.

$3\frac{1}{8}$ ⟵ Minuend

$-2\frac{1}{4}$ ⟵ Subtrahend

2) $\quad 7 - 3\frac{2}{5} =$

$\frac{7}{1} - \frac{17}{5} =$

El sustraendo está
indicado como fracción
impropia.

El minuendo está
indicado como
fracción impropia.

$7 = 6\frac{5}{5}$ ⟵ This is the
minuend after
regrouping.

$-3\frac{2}{5} = 3\frac{2}{5}$

PART IV   4-K3-5

Solve these problems by using the horizontal method. Convert
each mixed numeral to an improper fraction.

Resuelve estos problemas usando el método horizontal en
español. Convierte a fracción impropia.

1) $\quad 4\frac{3}{5} - 2\frac{3}{4} =$ 2) $\quad 17\frac{1}{3} - 8\frac{4}{5} =$

Subtract whole numbers from whole numbers and fractions
from fractions. Rename the minuend.

Resta separadamente las partes enteras y las fracciones.
Modifica el minuendo.

3) $\quad 12\frac{1}{3} - 4\frac{5}{12} =$ 4) $\quad 11\frac{2}{3} - 6\frac{3}{4} =$

Solve these problems by using either method.

5) $\quad 6\frac{1}{3} =$ 6) $\quad 8\frac{3}{4} - 6\frac{4}{5} =$

$\quad\quad - 2\frac{5}{6} =$

STRAND   <u>RATIONAL NUMBERS</u>   OBJECTIVE CODE   <u>4-K3-6</u>

OBJECTIVE   Read and write a three-place decimal.

___

SUGGESTED ACTIVITIES

In Spanish-speaking countries the students must recall <u>decimal</u> <u>orders.</u>   The tenths are called primer orden; the hundredths, segundo orden; the thousandths, tercer orden; and the ten-thousandths, cuarto orden.

<u>PART I</u>

Spanish-Speaking <u>Countries Method</u>	United States <u>Method</u>
When the decimal point is written in the Spanish-speaking countries, it is not necessary to read it. The whole unit is read first, and then the decimal. If the decimal point is read, however, it is read as <u>con</u> (with).	In English the whole number is read first; then the word <u>and</u> is said to indicate the decimal point; and finally the number and the name of the place with the last significant digit are given.

1st order decimal:

1.1   It is read: 1.1   It is read:
        un entero, un decimo;   one <u>and</u> one
        un entero <u>con</u> un decimo.   ten<u>th.</u>

2nd order decimal:

1.01   It is read: 1,01   It is read: one
        un entero, un centésimo;   <u>and</u> one hundredth.
1,01   un entero <u>con</u> un centésimo.

3rd order decimal:

1.001   It is read: 1,001   It is read: one
        · un entero, un milésimo;   <u>and</u> one thousandth.
1,001   un entero <u>con</u> un milésimo.

PART II   4-K3-6

Lee los siguientes números:

1) 25.102

   veinticinco enteros y ciento dos milésimos

2) 18.02

   dieciocho enteros con dos centésimos

3) 40.001

   cuarenta enteros y un milésimo

4) 1,45

   un entero con cuarenta y cinco centésimos

5) 1,060

   un entero con sesenta milésimos

6) 5,401

   cinco enteros y cuatrocientos un milésimo

Escribe los siguientes números:

1) trescientos treinta milésimos   _____

2) quinientos cuatro milésimos   _____

3) cuarenta y cinco milésimos   _____

4) un entero, cuarenta y cuatro centésimos _____

5) cuarenta enteros con cinco milésimos   _____

PART III   4-K3-6

Write several three-place decimal numbers in the appropriate
columns of a table displayed on the chalkboard or a chart.
Have the students write and read the decimal numbers using
and to indicate the decimal point.   Compare the English
form with the Spanish form.

Whole Unit Order

6th	5th	4th	3rd	2nd	1st
100,000	10,000	1,000	100	10	1

Decimal Order

Decimal Point	1st	2nd	3rd	4th	5th	6th
.	.1	.01	.001	.0001	.00001	.000001

1   .   7   0   9

Example:

1.709   un entero con setecientos nueve milésimos
        one and seven hundred nine thousandths

1) 7.04   _____

           _____

2) 132.747 _____

           _____

3) 326.085 _____

           _____

<u>PART IV</u>   4-K3-6

Write the following numbers:

Escribe los números siguientes: ...

1) five and five thousandths
    cinco enteros y cinco milésimos   _____

2) forty and seven thousandths
    cuarenta enteros y siete milésimos   _____

3) one hundred ten and twelve thousandths
    ciento diez enteros y doce milésimos   _____

4) seven hundred thousandths
    setecientos milésimos   _____

5) one hundred five and one thousandth
    ciento cinco enteros y un milésimo   _____

6) one hundred fifty thousandths
    ciento cincuenta milésimos   _____

7) eighty-one hundredths
    ochenta y un centésimos   _____

8) four hundred and ten thousandths
    cuatrocientos enteros con diez milésimos   _____

9) fifty and thirteen hundredths
    cincuenta enteros y trece centésimos   _____

10) one hundred five thousandths
    ciento cinco milésimos   _____

Note: If help is needed in reading Spanish, ask the teacher to
       allow one of the fluent Spanish-speaking students to read
       the numbers.

GRADE 6

Place Value

2-L1-1   Write whole numbers, including seven-place, in expanded form using exponents.

Operations with Whole Numbers

3-L1-6   Divide a three- or four-digit dividend by a three-digit divisor. (Estimate the partial quotient by rounding to the nearest hundred.)

Rational Numbers

4-L1-13   Divide fractions.

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OBJECTIVE Write whole numbers, including seven-place, in expanded form using exponents.

SUGGESTED ACTIVITIES

The translation of terms for place values is necessary for some Spanish-speaking students. The students from some Spanish-speaking countries, such as Spain, use a point rather than a comma to separate each period of a number.

<u>PART I</u>

Spanish-Speaking Countries Method	United States Method
$3.692 = (3 \times 10^3) + (6 \times 10^2)$ $+ (9 \times 10^1) + (2 \times 10^0)$	$3,692 = (3 \times 10^3) + (6 \times 10^2)$ $+ (9 \times 10^1) + (2 \times 10^0)$

8,495,526

8.495.526

$(8 \times 10^6) + (4 \times 10^5) + (9 \times 10^4) +$

$(5 \times 10^3) + (5 \times 10^2) + (2 \times 10^1) + (6 \times 10^0)$

PART II   2-L1-1

Marca correctamente los períodos de los números.   Luego
escríbelos en notación desarrollada.

    1)   6 125 426 =

    2)   3 969 =

    3)   7 941 643 =

    4)   123 456 =

    5)   841 907 =

    6)   6 413 216 =

    7)   308 341 =

    8)   4 491 613 =

    9)   82 624 =

  10)   213 001 =

PART III   2-L1-1

Review place values in the Spanish-speaking system and then
teach the English terms. If the students use points in place
of commas to separate digits for place value divisions, teach
the use of commas. Use the exponential forms to help show
the similarities of the two systems.

Review--   Then teach---

<u>Place</u>

Unidades	=	1×10^0	=	Units
Decenas	=	1×10^1	=	Tens
Centenas	=	1×10^2	=	Hundreds
Unidades de Millar	=	1×10^3	=	Thousands
Decenas de Millar	=	1×10^4	=	Ten Thousands
Centenas de Millar	=	1×10^5	=	Hundred Thousands
Unidades de Millón	=	1×10^6	=	Millions

PART IV   2-L1-1

Write numbers by using both systems of period division.
Expand the numbers and use the correct exponent.

Escribe los números siguientes, usando ambos sistemas de
separación de los períodos. Escríbelos en notación desarro-
llada usando el exponente correcto.

Número Number	Spanish-Speaking Countries Methods	United States Method	Expansion with Exponents
1) 648 912	648,912 648.912	648,912	$(6 \times 10^5) + (4 \times 10^4) +$ $(8 \times 10^3) + (9 \times 10^2) +$ $(1 \times 10^1) + (2 \times 10^0)$
2) 2 462 110			
3) 72 812			
4) 3 651 000			
5) 79 864			
6) 9 016 242			
7) 1 214			

STRAND <u>OPERATIONS WITH WHOLE NUMBERS</u>   OBJECTIVE CODE <u>3-L1-6</u>

OBJECTIVE Divide a three or four-digit dividend by a three-digit divisor. (Estimate the partial quotient by rounding to the nearest hundred.)

SUGGESTED ACTIVITIES

The division algorithm in the Spanish-speaking countries follows a process different from the one used in the United States. (See Objective 3-K1-6 for the division algorithm process.)

<u>PART I</u>

Spanish-Speaking
Countries Method

United States
Method

```
                                    →42   R6
9918 | 236 ←              →236 | 9918
478         42←                  944
006                              →478
                                  472
                                   →6
```

PART II   **3-L1-6**

Indica el número de cifras de cada uno de los cocientes que se te piden.   Luego divide para encontrar el cociente exacto.

Ejemplo:

```
 ✓   ✓
4 9 3 0 |1 2 0
```
El cociente tiene ___2___ cifras.

```
4 9 3 0 |1 2 0
0 1 3        4
```
El cociente es mayor que___40___.

```
4 9 3 0 |1 2 0
0 1 3 0      4 1
    1 0
```
El cociente es _____41___.

1) 3 9,4 7 3 |2 0 8

El cociente tiene _____ cifras.

El cociente es mayor que_____.

El cociente es _____.

2) 9 3,0 0 8 |5 1 6

El cociente tiene _____cifras.

El cociente es mayor que _____.

El cociente es _____.

3) 1 0,8 4 3 |7 4 1

El cociente tiene _____cifras.

El cociente es mayor que_____.

El cociente es_____.

4)   9,5 4 0 |4 2 5

El cociente tiene _____cifras.

El cociente es mayor que _____.

El cociente es_____.

Help the Spanish-speaking students to make the transition from
their own form of division to the form used in the United
States.   Follow this procedure:

Ask the students to write the symbol with angle opening down.
(⌐‾‾‾). Place the divisor at the left-hand side of the
dividend. Select the first division step that uses the same
number of digits in the dividend that are in the divisor.

799 will be the first
group of digits to
be divided. The first
three digits will give
the first digit on the
quotient line.
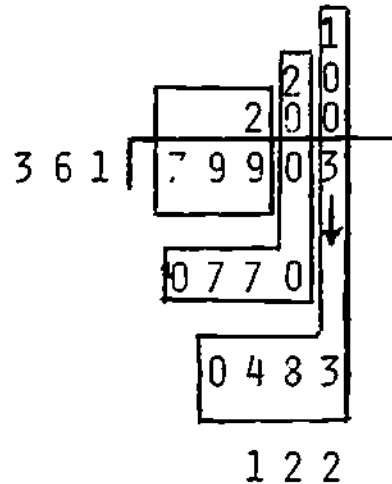
Each digit after this step
will give a digit on the
quotient line.

Divide the first group of
digits. Fill the second
and third places with
zeros.

Bring the next digit down
to make the second division
step. Divide a second time.

Write this quotient above
the zero in the tens place
of the first quotient.
Write a zero in the ones place.

Bring the next digit down to
make the third division step.
Divide for the third time.
Place this digit above the
ones place in the other
quotients.

The quotient is the sum of
the numbers on the quotient
line.


```
            1
          2 0
        2 0 0
3 6 1 | 7 9 9 0 3
      - 7 2 2 0 0
        0 7 7 0 3
      -   7 2 2 0
        0 4 8 3
      -     3 6 1
            1 2 2
```

```
    2 0 0
      2 0
+      1
  ─────
    2 2 1
```
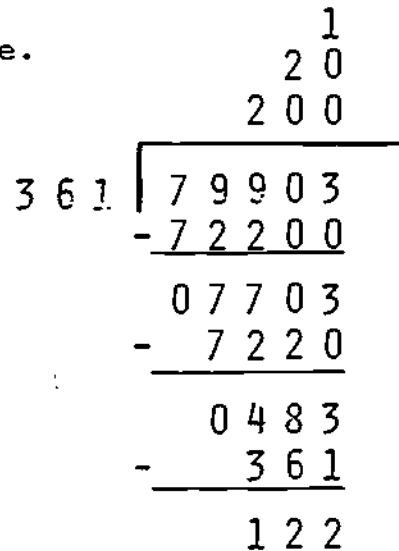
PART IV   3-L1-6

Assist the students to make the transition from one
algorithm form to the other by giving them individual
help.

Divide los siguientes números usando las dos formas; pri-
mero calcula cuantos lugares (cifras) tendrá el cociente.

1)   69,545 | 225   2)   98,761 | 506

3)   9,779 | 512   4)   10,911 | 801

5)   98,007 | 111   6)   19,681 | 820

7)   716,909 | 716   8)   65,832 | 410

9)   10,780 | 324   10)   66, 887 | 999

STRAND   <u>RATIONAL NUMBERS</u>   OBJECTIVE CODE   <u>4-L1-13</u>

OBJECTIVE   Divide fractions.

SUGGESTED ACTIVITIES

Division of fractions is performed in various ways in Spanish-speaking countries but the crisscross method is used most frequently. This metnod is used after mixed numerals have been converted to improper fractions. Some teachers advise the students to reduce the fractions to lowest terms before dividing.

In Spanish-speaking countries the division symbols (: and ÷) are used.

PART I

Spanish-Speaking Countries Method	United States Method

<u>Crisscross Method with Common Fractions</u>

The numerator of the first fraction is multiplied by the denominator of the second fraction to form the numerator of the quotient.

$$\frac{2}{3} \diagdown \frac{4}{6} = \frac{12}{}$$

The denominator of the first fraction is multiplied by the numerator of the second fraction to form the denominator of the quotient.

$$\frac{2}{3} \diagup \frac{4}{6} = \frac{}{12}$$

The quotient is reduced to the lowest terms.

$$\frac{2}{3} \diagdown \frac{4}{6} = \frac{12}{12} = \frac{1}{1} = 1$$

United States Method

$$\frac{2}{3} : \frac{4}{6} =$$

Divisor is inverted.

$$\frac{2}{3} \times \frac{6}{4} =$$

Fractions are reduced to lowest terms.

$$\frac{\overset{1}{2}}{\underset{1}{3}} \times \frac{\overset{2}{6}}{\underset{2}{4}} =$$

Numerators and denominators are multiplied.

$$\frac{1 \times 2}{1 \times 2} = \frac{2}{2} = 1$$

PART I (continued)   4-L1-13

     Spanish-Speaking
     Countries Method

Crisscross Method
with Mixed Numerals

Mixed numerals are converted
to improper fractions and
then reduced to lowest terms,
when possible. Then the
crisscross operation is
performed.

<u>PART II</u>   <u>4-L1-13</u>

Resuelve los siguientes ejercicios de dividir:

1) $3\frac{8}{9} : \frac{4}{5} =$ 6) $1\frac{8}{9} : \frac{13}{14} =$

2) $\frac{2}{3} : \frac{2}{3} =$ 7) $5\frac{5}{9} : \frac{2}{3} =$

3) $13\frac{4}{6} : 2\frac{7}{8} =$ 8) $6\frac{8}{9} : \frac{4}{6} =$

4) $4\frac{6}{13} : \frac{2}{4} =$ 9) $4\frac{5}{6} : \frac{5}{8} =$

5) $6\frac{5}{8} : 1\frac{6}{7} =$ 10) $2\frac{8}{11} : \frac{5}{9} =$

PART III   4-L1-13

Explain that the division process is usually performed in the
United States by using the reciprocal of the divisor and in
Spanish-speaking countries by multiplying the numerator and
denominator in a crisscross pattern or by using the reciprocal
method.

Spanish-Speaking Countries Method	United States Method

Note: Division symbols are
          : and ÷

1)

$$\frac{2}{3} \diagdown \cdot \diagup \frac{4}{3} \diagdown \rightarrow \frac{6}{12} = \frac{1}{2}$$

$$\frac{2}{3} \div \frac{4}{3} = \frac{2}{3} \times \frac{3}{4}$$

$$= \frac{\overset{1}{\cancel{2}} \times \overset{1}{\cancel{3}}}{\underset{1}{\cancel{3}} \times \underset{2}{\cancel{4}}} = \frac{1 \times 1}{1 \times 2} = \frac{1}{2}$$

2) $4\frac{2}{3} \div 1\frac{2}{5} =$

$$\frac{14}{3} \div \frac{7}{5} =$$

$$\frac{14}{3} \times \frac{5}{7} =$$

$$\frac{\overset{2}{\cancel{14}}}{3} \times \frac{5}{\underset{1}{\cancel{7}}} = \frac{10}{3}$$

$$\frac{10}{3} = 3\frac{1}{3}$$

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Spanish-Speaking
Countries Method

3) $\dfrac{2}{3} \div \dfrac{4}{3} =$

$\dfrac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{3}}} \times \dfrac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{4}}} = \dfrac{1}{2}$

    or

$\dfrac{2 \times 3}{3 \times 4} = \dfrac{\overset{1}{\cancel{6}}}{\underset{2}{\cancel{12}}} = \dfrac{1}{2}$

PART IV   4-L1-13

Solve the following problems:

Resuelve los siguientes problemas:

1) $1\dfrac{1}{3} \div \dfrac{5}{6} =$ 6) $18\dfrac{2}{9} \div \dfrac{4}{6} =$

2) $4\dfrac{8}{9} \div 1\dfrac{5}{7} =$ 7) $6\dfrac{3}{4} \div 1\dfrac{2}{3} =$

3) $5\dfrac{4}{8} \div \dfrac{6}{4} =$ 8) $9\dfrac{3}{6} \div 3\dfrac{7}{8} =$

4) $5\dfrac{8}{10} \div 1\dfrac{10}{11} =$ 9) $14\dfrac{1}{4} \div 6\dfrac{2}{3} =$

5) $6\dfrac{11}{12} \div 2\dfrac{3}{4} =$ 10) $16\dfrac{2}{7} \div 6\dfrac{4}{10} =$

ENGLISH/SPANISH VOCABULARY

The equivalent or most nearly accurate equivalent Spanish terms have been listed for the English terms used in the mathematical context.

English	Spanish
addend	sumando
adjacent	adyacente
associative property	propiedad asociativa
average	promedio
block, cube	cubo, hexaedro
border	orilla, borde, margen
boundary	límite, linde, lindero
braces; brackets	llaves
cardinality of a set	cardinalidad del conjunto
carry	llevar
Cartesian product	productos cartesianos
cent, penny	centavo, céntimo, centésimo
chalk	gis, tiza
chord	cuerda
classify	clasifica(r)
clock face	carátula
clock hands	manecillas
commutative property	propiedad comutativa
compound interest	interest compuesto
corner, vertex	vértice
cuisenaire rods	palillos de colores usados para contar o medir
black	negro (7 cm)
blue	azúl (9 cm)
brown	café (8 cm)
dark green	verde obscuro (6 cm)
green	verde claro (3 cm)
orange	naranja, anaranjado (10 cm)
purple	morado (4 cm)
red	rojo (2 cm)
white	blanco (1 cm)
yellow	amarillo (5 cm)
dates	datos, fechas
decimal fraction	número decimal
digit	cifra, dígito
distributive property	propiedad distributiva
dozen	docena
East, Orient	este, oriente
edge	arista
eight, eighth	ocho, octavo
encircle	encerrar en un círculo
end points	puntos extremos en toda línea

English	Spanish
equal; same	igual; lo mismo, el mismo
equidistant	igual distancia
even number	número par
expanded notation	notación desarrollada
exponent	exponente
finite set	conjunto finito
first	primero, primera
five, fifth	cinco; quinto, quinta
five hundred	quinientos
foot, feet	pie, pies
four, fourth	cuatro; cuarto, cuarta, cuadrante
fraction	fracción, fraccionado, quebrado
geoboard	tablero geométrico
graph	graficar, gráfica
greater than, more than	mayor que, más que
greatest common divisor (GCD)	máximo común divisor (MCD)
greatest common factor (GCF)	máximo común divisor (MCD)
half; halves	medio, mitad; medios, mitades
height	altura, alto
hundred; hundredth	cien, ciento; centésimo
hundreds place	centenas
inch	pulgada
income tax	impuesto sobre el sueldo
installment buying	compras a plazos
integers	números enteros
investments	inversiones
large, larger, largest	largo, más largo, el más largo
least common multiple (LCM)	mínimo común múltiplo (MCM)
left-hand side	a la izquierda
length	longitud
less than	menor que, menos que
light, lighter, lightest	liviano, más liviano, el más liviano
manipulate	manipular
manipulative materials	objetos manuales usados en el salón de clase
mass, weight	masa, peso
match	emparejar
maze	laberinto
measure	medir, medida
measurement	medida
mixed numerals	fracción mixta
Monday	lunes
multiplication facts	tablas de multiplicar

English	Spanish
narrow	angosto
nine, ninth	nueve, noveno
October 12, 1981, 10/12/1981	12 de octubre de 1981, 12/10/1981
odd number	número non, impar
one; ones place	uno, una; unidades
one hundredth	un centésimo
one tenth	un décimo
one thousandth	un milésimo
ordered pairs	números ordenados (1, ⁻4)
ordinal numbers	números ordinales
outcome	resultado
pair	par, emparejar, formar pares
percent, percentage	porciento, porcentaje
pint (nonexistent in Spanish)	equivale a dos tazas
place value	valor relativo de los números
plane	plano
power of a number	potencia de un número
protractor	transportador
quart	un cuarto de galón
quarter	un cuarto de dólar, cuarto, cuadrante
quarterly	trimestralmente
rate pair (nonexistent in Spanish)	razón de dos números
regrouping	reagrupar
remainder	residuo
rename	convertir números de un valor a otro (ej: unidades a decenos o centenos o viceversa)
right-hand side	a la derecha
right triangle	triángulo rectángulo
round off	redondear
same	el mismo, lo mismo
sandpaper	papel de lija
Saturday	sábado
scale	escala, balanza, romana, báscula
score	puntuación
second	segundo (orden)
sequence	orden, secuencia
sets	conjunto
seven, seventh	siete, séptimo
short, shorter, shortest	corto, más corto, el más corto

English	Spanish
six, sixth	seis, sexto
space regions, solid	cuerpo geométrico
spring scale	balanza de resorte
square	cuadrado
square number	el producto de dos factores iguales, el cuadrado de un número
square root	raíz cuadrada
straight	derecho
straightedge	escuadra
straight line	línea recta
stylus	punta metálica del compás
subset	subconjunto
subtrahend	substraendo, sustraendo
subtraction	resta, substracción, sustracción
Sunday	domingo
tactual	táctil (tocando con las manos)
tag board	boletín, tablero de etiquetas
take away	restar, quitar, sacar
tenness (base ten)	base diez
ten thousands place	decenas de millar
ten thousandth	diez milésimo
ten thousandths place	décimo de millar
third, one-third	tercero, un tercio
thirty-nine	treinta y nueve
Thursday	jueves
thousand, thousandth	mil, milésimo
thousands place	unidades de millar
Tuesday	martes
twenty-five	veinticinco
unit whole	entero, unidad
yard	yarda
Wednesday	miércoles
weigh	pesar
weight(s)	peso, pesa(s)
west	poniente, occidente
width	ancho
zero	cero (0)

SUPPLEMENT FOR CURRICULUM GUIDE FOR MATHEMATICS:
SPANISH-SPEAKING STUDENTS
TEACHER EVALUATION FORM

Use this form to evaluate the supplement. Put a number from 1 to
4 in each box according to the scale below:

1 poor   2 fair   3 good   4 excellent

Return the completed form to the Bureau of Mathematics, Room 838,
Department of Curriculum, Mail Run #84.

School _____ District ____ Date _____ Teacher _____

Objective	Part of Lesson	Evaluation				Comments
		Significance of Differentiation	Adequacy of Presentation	Usefulness of Materials	Adequacy of Format	
2-J1-2	I					
	II					
	III					
	IV					
2-J1-3	I					
	II					
	III					
	IV					
3-J1-16	I					
	II					
	III					
	IV					
3-J1-17	I					
	II					
	III					
	IV					
3-J1-19	I					
	II					
	III					
	IV					
5-J1-3	I					
	II					
	III					
	IV					
2-K1-1	I					
	II					
	III					
	IV					
2-K1-3	I					
	II					
	III					
	IV					
3-K1-2	I					
	II					
	III					
	IV					

Objective	Part of Lesson	Significance of	Differentiation	Adequacy of Presentation	Usefulness of Materials	Adequacy of Format	Comments
				Evaluation			
3-K1-6	I						
	II						
	III						
	IV						
3-K1-7	I						
	II						
	III						
	IV						
4-K1-7	I						
	II						
	III						
	IV						
4-K2-3	I						
	II						
	III						
	IV						
4-K2-5	I						
	II						
	III						
	IV						
4-K3-5	I						
	II						
	III						
	IV						
4-K3-6	I						
	II						
	III						
	IV						
2-L1-1	I						
	II						
	III						
	IV						
3-L1-6	I						
	II						
	III						
	IV						
4-L1-13	I						
	II						
	III						
	IV						
	I						
	II						
	III						
	IV						
	I						
	II						
	III						
	IV						