Principal Investigator
E. Paul Goldenberg

Curriculum Design and Pedagogy Oversight
E. Paul Goldenberg    Lynn Goldsmith    Nina Shteingold

Research
Director: Lynn Goldsmith
Nina Arshavsky
Cynthia Char
Sabita Chopra
Sophia Cohen
Andrea Humez
Suenita Lawrence
Katherine Schwinden
Eugenia Steingold

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Director: Frances Fanning
Nicholas Bozard    Eric Karnowski

Writing
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Abigail Branch
Sara Cremer
E. Paul Goldenberg
Stacy Grossman
Andrea Humez
Suenita Lawrence
Debora Rosenfeld
Paisley Rossetti
Nina Shteingold
Kate Snow
Julie Zeringue

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Jessica Cummings
Jennifer Putnam
E. Charles Snow
Jenny Wong

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Amy Borowko
Nannette Feurzeig
Kim Foster
Alexander Kirchwey
Helen Lebowitz
June Mark
Kimberly Newson
David O’Neil
Cynthia Plouff

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Richard Askey, Professor of Mathematics, Emeritus
University of Wisconsin, Madison, Wisconsin
Roger Howe, Professor of Mathematics
Yale University, New Haven, Connecticut
Harvey Keynes, Professor of Mathematics
University of Minnesota, Minneapolis, Minnesota
David Singer, Professor of Mathematics
Case Western Reserve University, Cleveland, Ohio
Sherman Stein, Professor of Mathematics, Emeritus
University of California at Davis, Davis, California

Additional Mathematics Resource
Al Cuoco, Center Director, Center for Mathematics Education,
Education Development Center, Newton, Massachusetts

Advisors
Peter Braunfeld    June Mark
David Carraher    Ricardo Nemirovsky
Carole Greenes    James Newton
Claire Groden    Judith Roitman
Carol Malloy    Deborah Schifter

Evaluators
Douglas H. Clements    Mark Jenness
Cynthia Halderson    Julie Sarama
Count the shaded and unshaded dots. Complete the number sentences to match.

<table>
<thead>
<tr>
<th></th>
<th>6</th>
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</table>

4 What can you say about the pair of number sentences in each problem?

1 one 1
Count the objects in each group. Complete the number sentences to match.

**Challenge** Draw and shade dots on the blank card. Write number sentences to match.

2 two I I prime
Making 10, Adding 10

Complete the problems so that the fact families and the stories match.

1. The Martins have 10 pets. They have 6 dogs. The other pets are kittens.

2. Devin walked 8 blocks. He stopped and took 3 rocks out of his shoe. Then he walked 2 more blocks to the library.

How far did Devin walk?

3. Use the numbers given. For 3 and 4, write your own stories.

4. prime △ III three 3
4 Denise has 10 books. Her sister has 1 more than Denise. How many books do they have altogether?

5 Challenge Together, Sophia and Allison have 10 stuffed animals. Sophia has 2 more than Allison. How many stuffed animals does each girl have?
1 Fill in the missing sums.

What can you say about the sum of the two circles at the top and bottom and the sum of the two circles on the left and right?

prime V five 5
Complete the puzzle.

Challenge

6 six VI △ 2 3
Continue the jumps on the number line. Fill in the shapes with the missing numbers.

1.

0 1 2 3 4 5 6 7

2.

0 1 2 3 4 5 6 7

3.

0 1 2 3 4 5 6 7

4.

0 10 20 30 40 50 60 70

Describe a pattern you see in numbers on this page.

- prime
- VII
- seven 7
Fill in the shapes with the missing numbers.

8

\[
\begin{array}{c}
8 \\
\rightarrow \\
\rightarrow \\
2 \\
\rightarrow \\
3 \\
\rightarrow \\
5 \\
\end{array}
\]

7

\[
\begin{array}{c}
2 \\
\rightarrow \\
4 \\
\rightarrow \\
8 \\
\rightarrow \\
\star \\
\end{array}
\]

8

\[
\begin{array}{c}
\triangle \\
\rightarrow \\
6 \\
\rightarrow \\
9 \\
\rightarrow \\
15 \\
\rightarrow \\
\star \\
\end{array}
\]

9

\[
\begin{array}{c}
\hexagon \\
\rightarrow \\
10 \\
\rightarrow \\
20 \\
\rightarrow \\
30 \\
\rightarrow \\
\star \\
\end{array}
\]

10 Challenge

\[
\begin{array}{c}
15 \\
\rightarrow \\
\rightarrow \\
25 \\
\rightarrow \\
\rightarrow \\
\star \\
\end{array}
\]

8 eight VIII 2 2 2
Adding on the Number Line

Use the number line to complete the addition sentence. Show each jump on the number line.

1. Start at 38 and jump to 42. How many spaces did you jump?

   - Number line:
     - Start at 35, end at 45
     - Mark 38 and 42

   - Calculation:
     - 42 - 38 = 4 spaces

2. Tara jumped 3 spaces forward and landed at 172. Where did she start?

   - Number line:
     - Start at 159, end at 172
     - Mark 172

   - Calculation:
     - 172 - 3 = 169

3. Sam started at 296 and jumped 6 spaces forward. Where did he land?

   - Number line:
     - Start at 288, end at 300
     - Mark 296 and 300

   - Calculation:
     - 296 + 6 = 302

4. Write a problem to match the number sentence.

   - Number line:
     - Start at 990, end at 1004
     - Mark 995 and 1004

   - Problem:
     - 995 + 5 = 1000

IX  nine 9
Use the number line to complete the number sentences.

5

22  ____! 28
28  2! ____

6

____  2! 77
77  5! ____

7

91  ____! 99
99  1! ____

Challenge

8

62  ____! 57
____  4! 52

9

____  7! 68
____  10! 69

10  ten  X  △  2  5
Subtracting on the Number Line

Record the jump by drawing an arrow. Complete the number sentence.

1. Start at 28 and jump to 23. How many spaces did you jump?

[Diagram showing a number line with arrows from 28 to 23]

2. Lex jumped 4 spaces backward and landed at 41. Where did he start?

[Diagram showing a number line with arrows from 41 to 4]

3. Sara started at 39 and jumped 7 spaces backward. Where did she land?

[Diagram showing a number line with arrows from 39 to 32]
Layla started at 413 on the number line and jumped backward 8 spaces. Then she jumped forward 3 spaces. Where did she land?
Skip-Counting

Write the missing numbers in the shapes.

1. 

2. 

3. 

4. Miri collected coins. To count the number of coins in her collection, she put them in groups of 4 and skip-counted aloud by 4. She made 8 groups of coins. List the numbers she said.

prime XIII thirteen 13
Number only the unshaded squares.

Complete the number pattern.

6

0, 2, 4, _, _, _, _, 14, _, _, _, _

7

_, _, 16, 14, 12, _, _, _, 4, _, _, _

8

1, 3, 5, _, _, _, 11, _, _, 17, _, _, _

9 Challenge

_, 6, 11, _, _, _, 31, _, _, 46, _

14 fourteen XIV 2 7
Finding Missing Parts

Find a rule.
1. 26, 24, 22, __, __, __, __, __, __, __, 12, __, __, __
2. __, 30, 27, __, __, __, __, 18, __, __, __, 6, __

Fill in the missing part.
3. 9 __ 7 16
4. 12 __ 4 8
5. 8 3 4 ___ 1
6. 6 " 5 " ___ 15

Total number of stars: ___
Number of stars crossed out: ___
Number of stars NOT crossed out: ___

Compare the patterns in Problems 1 and 2.
Find a rule.

9 9, 15, 27, 25, 23, 21, 19, 17, 15
10 13, 38, 35, 32, 26, 23, 20, 17

Fill in the missing parts.

11 8 3 9 1 2
12 11 5 6 1

13 7 5 11 5 4
14 9 5 3 8 3

A

B

C

D

Total number of shapes: 8 8 8 8
Number of shapes crossed out: 3 5 7
Number of shapes NOT crossed out: 8 8 8 8

Challenge Find a rule.

10 8 10 11 23 13 20 40 21
d
6 3 3 9 6 3 19 7 1
e
4 5 7 1 20 0 10 17 68
d' e

16 sixteen XVI 2 2 2 2
1 Yoshi and Tyra were playing with 8 counters. They wondered how many ways they could separate the counters into 2 piles. How many ways could they do it?

Example: Pile 1 Pile 2

Cross out any sentences you do NOT need.

2 Ana and Mark collect erasers. Together they have **15 erasers**. Complete the table for the numbers of erasers they might each have.

<table>
<thead>
<tr>
<th>Ana’s erasers</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark’s erasers</td>
<td>12</td>
</tr>
</tbody>
</table>

**Problem Solving Strategy**  
*Act It Out*

NCTM Standards 1, 2, 6, 7, 8, 9, 10
Problem Solving Test Prep

Choose the correct answer.

1 The ▲ and ◆ are different numbers between 0 and 8. In how many different ways can you complete this number sentence?

▲ ◆ 8

A. 4  C. 9
B. 6  D. 16

2 Which number is NOT a possible sum if each ▲ is the same number?

▲ ◆ ◆

A. 14  C. 19
B. 16  D. 24

3 Which number sentence matches this story?

Sam has 8 toys. He gives 3 toys to his sister. How many toys does Sam have now?

A. 11 ! 8  3  C. 8 ! 5  3
B. 8  3  11  D. 8 ! 3  5

4 Use the digits 4, 5, and 6. What three-digit number can you make that is the closest to 500?

A. 465  C. 645
B. 546  D. 654

Show What You Know

Solve each problem. Explain your answer.

5 Mrs. Brown has 3 groups of students. Each group has 2 packages of markers for an art project. There are 8 markers in each package. How many markers do the students have in all? Explain.

----------------------------------------------------------

----------------------------------------------------------

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6 Kyle has 11 pennies. He wants to make 2 piles and use all the pennies. In how many different ways can he make 2 piles of pennies? Explain how you know you found all possible ways.

----------------------------------------------------------

----------------------------------------------------------

----------------------------------------------------------

----------------------------------------------------------
Chapter 1

Review/Assessment

NCTM Standards 1, 2, 6, 7, 8, 9, 10

Complete the fact family to match the story.

1. Kofi walks **10 blocks** to school. If he has already walked **7 blocks**, how many more blocks does Kofi have to walk?  **Lessons 1 and 2**

2. Write a story to match the fact family.  **Lesson 2**

3. Fill in the missing sums.  **Lesson 3**
**Find the missing number for each tag. Lessons 4 and 7**

![Number line with tags](image)

**Use the number line to complete the number sentence. Lessons 5 and 6**

![Number line](image)

**Write the missing operation sign. Lesson 8**

<table>
<thead>
<tr>
<th></th>
<th>12</th>
<th>3</th>
<th>9</th>
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<td>7</td>
<td>3</td>
<td>10</td>
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</table>

**Don and Frank went fishing. Together they caught 5 fish. What are all the numbers of fish each boy might have caught? Lesson 9**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Don</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frank</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20 twenty XX 2 2 5
### Recognizing Rectangular Arrays

**How many dots?**

<p>| | | | | | | | |</p>
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</tr>
</thead>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td><img src="image1" alt="Array" /></td>
<td><img src="image2" alt="Array" /></td>
<td><img src="image3" alt="Array" /></td>
<td><img src="image4" alt="Array" /></td>
<td><img src="image5" alt="Array" /></td>
<td><img src="image6" alt="Array" /></td>
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<td><img src="image9" alt="Array" /></td>
<td><img src="image10" alt="Array" /></td>
<td><img src="image11" alt="Array" /></td>
<td><img src="image12" alt="Array" /></td>
<td><img src="image13" alt="Array" /></td>
<td><img src="image14" alt="Array" /></td>
<td><img src="image15" alt="Array" /></td>
<td><img src="image16" alt="Array" /></td>
</tr>
</tbody>
</table>

17. Sometimes the same array is shown in two problems above. List the pairs of problems that have the same array and explain why the pairs match.
In the third grade classroom, there are 4 rows of chairs. Each row has 3 chairs. How many chairs are in the classroom? Draw a picture to show how you solve the problem. Write a number sentence to show your answer.

How many dots?

Challenge

22 twenty-two  2  11
Arrays of Square Tiles

Count the number of square tiles in each part of the array. Write an addition sentence to show the number of tiles in the picture.

1. 

2. 

3. 

4. 

5. 

6. Jake put 15 chairs into 3 equal rows. How many chairs were in each row? Draw a picture to show how you solved the problem. Write a number sentence to show your answer.

prime XXIII twenty-three 23
Using vertical or horizontal lines, cut each figure into 2 or 3 rectangular arrays. Write an addition sentence about your picture.
### Intersecting Lines

Use the maps to complete the table.

1. **Maps with 1 street**
   - **A**
   - **B**
   - **Horizontal**: 0
   - **Vertical**: 1
   - **Intersections**: 0

2. **Maps with 2 streets**
   - **A**
   - **B**
   - **C**
   - **Horizontal**: [Blank]
   - **Vertical**: [Blank]
   - **Intersections**: [Blank]

3. **Maps with 3 streets**
   - **A**
   - **B**
   - **C**
   - **D**
   - **Horizontal**: 0, 1, 2, 3
   - **Vertical**: 3, 2
   - **Intersections**: 2, 0

NCTM Standards 1, 2, 6, 7, 8, 9, 10

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**4** Draw maps with 4 streets. Then complete the table.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>0</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intersections</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**E** Draw the missing 4-street map.

**5** Draw maps with 5 streets. Then complete the table.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>3</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Vertical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Intersections</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**F** Draw the missing 5-street map.

**Challenge** Terrance draws a map with 7 intersections. How many streets does his map have? Use numbers, pictures, or words to explain your answer.

________________________________________________________________________

________________________________________________________________________

26 twenty-six 2 13
Visualizing Intersections

How many horizontal lines? How many vertical lines? How many intersections?

1

2

3

4

5

twenty-seven

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Solve the problem.

Yuji drew 4 horizontal lines on a transparency. Sandra drew some vertical lines on a transparency. They stacked their transparencies and counted 8 intersections. How many vertical lines did Sandra draw?

Each circle touches two sets of lines. In each circle, write the number of intersections you would see if the two sets of lines were both part of the same map.

Challenge Complete the table.

<table>
<thead>
<tr>
<th></th>
<th>2</th>
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<th></th>
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<td></td>
<td>2</td>
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<td>6</td>
<td>9</td>
<td>12</td>
<td>8</td>
<td></td>
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</tbody>
</table>
A tiny town has 6 streets and 8 intersections. Draw a map of the town. Explain how you found your answer.
Use the information in the table and in the pictures to complete the maps and fill in the table.

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<th>3</th>
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<tbody>
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<td>3</td>
<td>5</td>
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<tr>
<td>9</td>
<td>4</td>
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<td>11</td>
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<td>12</td>
<td>18</td>
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<td>13</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>5</td>
</tr>
</tbody>
</table>

30 thirty XXX 2 3 5
List all the pairs. Write the number of pairs.

1. e, f, g, M, N, O, P
   \[ \text{pairs} \]

2. R, S, T, U, J, k
   \[ \text{pairs} \]

3. 1, 2, 3, A, B, C, 1A, 2C
   \[ \text{pairs} \]

prime thirty-one 31
How many different pizzas can you make if you choose one kind of crust and one kind of meat?

______ pizzas

Customers can order a thin crust pizza with one meat and one vegetable. How many choices do the customers have?

______ choices

Challenge How many thin crust pizzas can you make with three kinds of vegetables and no meat? Explain how you know.

______________________________
______________________________
______________________________
______________________________

32 thirty-two XXXII 2 2 2 2
Listing Combinations

List all of the two-digit numbers by using a tens digit from the shaded box and a ones digit from the white box.

1. 4, 7

2. 4, 5

3. 1, 2, 3

NCTM Standards 1, 2, 6, 9, 10
Predict the number of combinations of one kind of sandwich with one kind of topping.

<table>
<thead>
<tr>
<th>Sandwiches</th>
<th>Toppings</th>
<th>Combinations</th>
</tr>
</thead>
</table>

List all the combinations for one kind of sandwich with one topping.

<table>
<thead>
<tr>
<th>Sandwich</th>
<th>Topping</th>
<th>Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamburger</td>
<td>Pickles</td>
<td></td>
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</tbody>
</table>

**Challenge** Donna will not eat pickles or onions. Write a multiplication sentence to find the number of combinations of one kind of sandwich with one topping that Donna will eat.

**Challenge** Dino will not eat hot dogs or hamburgers. Write a multiplication sentence to find the number of combinations of one kind of sandwich with one topping that Dino will eat.
Write a multiplication sentence to describe each array.

1. 
   \[ \text{rows} \times \text{columns} \times \text{dots} \]

2. 
   \[ \text{rows} \times \text{columns} \times \text{dots} \]

3. 
   \[ \text{rows} \times \text{columns} \times \text{dots} \]

4. 
   \[ \text{rows} \times \text{columns} \times \text{tiles} \]

5. 
   \[ \text{rows} \times \text{columns} \times \text{tiles} \]

6. 
   \[ \text{rows} \times \text{columns} \times \text{tiles} \]

7. 
   \[ \text{rows} \times \text{columns} \times \text{dots} \]

8. 
   \[ \text{rows} \times \text{columns} \times \text{dots} \]

9. 
   \[ \text{rows} \times \text{columns} \times \text{dots} \]

10. 
    \[ \text{rows} \times \text{columns} \times \text{dots} \]

11. 
    \[ \text{rows} \times \text{columns} \times \text{dots} \]

12. 
    \[ \text{rows} \times \text{columns} \times \text{dots} \]

13. 
    \[ \text{rows} \times \text{columns} \times \text{tiles} \]

14. 
    \[ \text{rows} \times \text{columns} \times \text{tiles} \]

15. 
    \[ \text{rows} \times \text{columns} \times \text{tiles} \]
Complete the diagram. Write a multiplication sentence to match.

Min has three kinds of ice cream and two kinds of toppings. How many different one flavor–one topping sundaes can she make? Use words, pictures, or numbers to explain your answer.

sprinkles  hot fudge  vanilla  chocolate  strawberry

_____ sundaes

Challenge If Min gets two new toppings and one new flavor of ice cream, how many one flavor–one topping sundaes can she make with all of the flavors and toppings she has now? Use words, pictures, or numbers to explain your answer.
Fill in the blanks.

1. Number of lines: [ ] [ ]
   Number of intersections: [ ] [ ]

2. Number of lines: [ ] [ ] [ ]
   Number of intersections: [ ] [ ] [ ]

3. Number of lines: [ ] [ ] [ ] [ ] [ ]
   Number of intersections: [ ] [ ] [ ] [ ] [ ]

Prime thirty-seven 37
Complete the maps and the number sentences.

4
5
6

7 Phillip drew a map with 8 intersections. When he added the number of streets, he got an even number. Describe Phillip’s map.

8 Challenge Find all the ways to make 24 intersections.

vertical horizontal

Challenge
Breaking Products into Factors

A map has 14 intersections and 2 vertical streets.

1. Draw the map.

2. How many horizontal streets are there?
   - Horizontal streets

3. Solve.
   - 2
   - 14
   - 14
   - 2

16 dots are arranged in a rectangular array. The array has 4 rows.

4. Draw the array.

5. How many columns are there?
   - Columns

   - 4
   - 16
   - 16
   - 4

6 boys are sharing 18 pretzels.

7. Draw a picture to show how many pretzels each boy would get.

   Each boy gets pretzels.

8. Solve.
   - 6
   - 18
   - 18
   - 6

3 13 XXXIX thirty-nine 39
For each number of intersections, draw a map and complete the multiplication sentence.

<table>
<thead>
<tr>
<th></th>
<th>15 intersections</th>
<th></th>
<th>9 intersections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>11</td>
<td>10 intersections</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>12</td>
<td>21 intersections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Challenge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List all the factors of 12: ________________________________

40 forty 2 2 2 5
Write a multiplication sentence for each part of the big array. Find the number of the tiles in the parts to finish the multiplication sentence for the big array.

1

![Array Diagram]

W: 5 5
X: 5 1
Y: 2 5
Z: 2 1
W X Y Z
7 6

2

![Array Diagram]

S: 
T: 
U: 
V: 
S T U V

prime XLI forty-one 41
Separate each array into two, three, or four parts. Label each part with its number of tiles. Find the sum of the tiles in the parts to finish the multiplication sentence for the big array.

**Challenge** Fill in the missing numbers in this number sentence. (Think about separating a big array into parts.)

\[(10 \times 10) + (4 \times 12) + (3 \times 10) + 14 = 13\]

42 forty-two

2 3 7
Solve each problem. Use the large white space to draw a picture if you want.

1 The Writing Store has pens, pencils, crayons, chalk, and markers. Each writing tool comes in blue, green, and red. How many different items do they sell?

2 Max has 27 pennies. He makes 3 equal stacks. How many pennies are in each stack?

3 Leticia begins her art project by drawing 7 lines on her paper. She draws some horizontal lines and some vertical lines. How many intersections can she make with the 7 lines?

4 Connor needs 30 batteries for his science project. There are 4 batteries in 1 package. If he buys 7 packages, will he have enough batteries? Explain.
Problem Solving Test Prep

Choose the correct answer.

1. Miss Reef wrote these four digits on the board:

What is the largest possible four-digit number you can write with these digits?

A. 5,367  
B. 6,357  
C. 7,563  
D. 7,653

Which number completes the number sentences?

\[ 5 \quad 30, \ 30 \ \square \ \ \ \ 5 \]

A. 6  
B. 5  
C. 1  
D. 0

Show What You Know

Solve each problem. Explain your answer.

3. Mr. Gomez will give his son 1 type of fruit and 1 type of cereal for breakfast. He can choose from 3 types of fruit and 2 types of cereal. How many different combinations of 1 fruit and 1 cereal are possible? Explain how you know.

4. What multiplication sentence can you write for \( 2 \times 2 \times 2 \times 2 \times 2 = 10 \)? Explain how you know.
Write the number of dots or tiles in each picture. Lessons 1, 2, and 11

1

2

Complete the map and the table. Lessons 3, 4, and 5

3

4

Horizontal 4
Vertical 5
Intersections

Horizontal
Vertical 3
Intersections 18

There are 4 hikers and 2 bicyclists. Every hiker shakes hands with every bicyclist. How many handshakes are there? Lessons 6 and 7

_____ handshakes

3 3 5 △ XLV forty-five 45
Find all the two-digit numbers with a tens digit from the shaded box and a ones digit from the white box. Lessons 6 and 7

3, 6 0, 2, 4

_____ two-digit numbers

Write a multiplication sentence for Problems 7 and 8. Lessons 8 and 9

7

9 dots are arranged in a rectangular array. The array has 3 rows. Draw the array.

Solve: 3 9

8

A map has 14 intersections and 2 horizontal streets. Draw the map.

Solve: 2 14

Solve the problem. Lesson 12

11 Three girls are sharing 27 grapes. They each will get the same amount. How many grapes will each girl get?

_____ grapes

46 forty-six XLVI 2 23
Introducing Magic Squares

Find all the sums and answer the questions.

1. Which sum occurs most often? ___
   How many times does it occur? ___
   Is this a magic square? ___

2. Which sum occurs most often? ___
   How many times does it occur? ___
   Is this a magic square? ___

3. Which sum occurs most often? ___
   How many times does it occur? ___
   Is this a magic square? ___

4. Which sum occurs most often? ___
   How many times does it occur? ___
   Is this a magic square? ___
Which arrays are magic squares? Score each array by finding all the sums, seeing which sum occurs most often, and counting the number of times that sum occurs.

Score: [ ] Magic? [ ]

Moniqua says she can make a magic square by adding ten to each of the numbers in a magic square. Do you agree or disagree? Explain your answer using numbers, pictures, or words.

Challenge

Score: 7 Magic? [ ]

48 forty-eight XLVIII 2 2 2 2 3
Completing Magic Squares

Complete the magic squares so that each row, column, and diagonal has the same sum.

1.

<table>
<thead>
<tr>
<th>2</th>
<th>9</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15  15  __

2.

<table>
<thead>
<tr>
<th>4</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15   15   15

3.

<table>
<thead>
<tr>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

|   |   |   |

15   __   __

4.

<table>
<thead>
<tr>
<th>8</th>
<th>1</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|   |   |   |

   __ __ __

NCTM Standards 1, 2, 6, 7, 8, 9

© Education Development Center, Inc.
Complete these magic squares so that each row, column, and diagonal has the same sum.

5

<table>
<thead>
<tr>
<th>12</th>
<th>27</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>9</td>
</tr>
<tr>
<td>18</td>
<td>15</td>
</tr>
</tbody>
</table>

6

<table>
<thead>
<tr>
<th>18</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>9</td>
</tr>
<tr>
<td>12</td>
<td>27</td>
</tr>
</tbody>
</table>

7

<table>
<thead>
<tr>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>30</td>
</tr>
</tbody>
</table>

8

<table>
<thead>
<tr>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
</tr>
<tr>
<td>48</td>
</tr>
</tbody>
</table>

9 Challenge Make your own magic square using the numbers 2 through 10 so that each row, column, and diagonal has a sum of 18.

<table>
<thead>
<tr>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>
**How Many Marbles?**

Complete each table.

1. **Suppose you have 20 marbles.**

<table>
<thead>
<tr>
<th>If you put marbles into Box A,</th>
<th>then you put marbles into Box B.</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

2. **Suppose you have 50 marbles.**

<table>
<thead>
<tr>
<th>If you put marbles into Box A,</th>
<th>then you put marbles into Box B.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>25</td>
<td>48</td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>26</td>
</tr>
<tr>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

3. Lily invites 25 friends to her house to play marble games. She invites 12 boys. How many girls does Lily invite? Explain how you found your answer.

Answer: 

---

**NCTM Standards 1, 2, 5, 6, 7, 8, 9, 10**

© Education Development Center, Inc.
Suppose that you have 12 marbles, and put them into Box A and Box B. Write all the possible addition sentences for the following:

<table>
<thead>
<tr>
<th>Box A</th>
<th>Box B</th>
<th>Total Marbles</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

How do you know you wrote all the possible addition sentences?

Challenge Jill has some number of marbles. She puts them into the two boxes, and graphs the point that shows the number of marbles in each box.

A How many marbles does Jill have?

_____ marbles

B Find another arrangement of the marbles in the two boxes and graph the point.
Gabe has a dime bank with 4 dimes in it. He receives some dimes for his birthday. He puts all the dimes he receives into his dime bank.

1. If he receives:
   - 1 dime, then he has 50¢ in the bank.
   - 3 dimes, then he has _____ in the bank.
   - _____ dimes, then he has 60¢ in the bank.

2. Record some of the possibilities in the table.

<table>
<thead>
<tr>
<th>If he receives dimes,</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>4</th>
<th>8</th>
<th>7</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>then he has ¢ in his bank.</td>
<td>50</td>
<td>60</td>
<td>100</td>
<td>140</td>
<td>240</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Can you find the total number of possibilities? Explain.
Sam has some pennies. Kevin has 4 more pennies than Sam. Andrew has twice as many pennies as Sam.

4 Complete the table.

<table>
<thead>
<tr>
<th>If Sam has ☢ 1 2</th>
<th>1 2</th>
<th>7 10 17</th>
<th>8 20 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>. . . then Kevin has ☢ 7 10 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>. . . and Andrew has ☢ 8 20 50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5 Who has the smallest amount of money? __________

6 Who has the largest amount of money?
Explain.

7 **Challenge** Judy has 8¢ more than Kari.
Kari has half as much money as Lea. Lea has the same amount of money as Judy. How much money does each girl have?

Judy  Kari  Lea

54 fifty-four  LIV  2  3  3  3
Joel has 3 coins in his hand. None of the coins are worth more than a dime.

1. Complete the table to find all the possible coin combinations.

<table>
<thead>
<tr>
<th>Dimes</th>
<th>Nickels</th>
<th>Pennies</th>
<th>Amount (in cents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>210</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>1</td>
<td>201</td>
</tr>
</tbody>
</table>

2. The largest amount of money Joel could have is _____¢.

3. The smallest amount of money Joel could have is _____¢.

4. There are _____ different amounts that can be made from 3 coins when none of them are worth more than a dime.
List all the different coin combinations worth 26¢.

<table>
<thead>
<tr>
<th>Quarters</th>
<th>Dimes</th>
<th>Nickels</th>
<th>Pennies</th>
<th>Amount (in cents)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Challenge**

Amy has 26¢. She does not have 26 coins. What can you say about this situation?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
### Using the Fewest Coins

1. **Make 14¢ in as many ways as possible. You may not need all the rows.**

<table>
<thead>
<tr>
<th>D</th>
<th>N</th>
<th>P</th>
<th>Number of Coins</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   What is the smallest number of coins needed to make 14¢?

   _____ coins

2. **Make 18¢ in as many ways as possible. You may not need all the rows.**

<table>
<thead>
<tr>
<th>D</th>
<th>N</th>
<th>P</th>
<th>Number of Coins</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   What is the smallest number of coins needed to make 18¢?

   _____ coins

3. **Show how to make each amount using the fewest coins.**

<table>
<thead>
<tr>
<th>D</th>
<th>N</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>7¢</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>16¢</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20¢</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24¢</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Solve each problem. You can use quarters, dimes, nickels, and pennies.

4 Tran has two coins of one kind and two coins of a different kind. What is the largest amount of money he could have? Explain.

5 Sue has 1 quarter, 1 dime, and 2 pennies. She exchanges some coins and now has five coins that total the same amount of money. What are Sue's five coins?

6 Devi has 64¢.

   What is the largest number of pennies he could have?  
   What is the largest number of nickels he could have?  
   What is the largest number of dimes he could have?  
   What is the largest number of quarters he could have?

7 Challenge  Jenny has 4 coins. She cannot make the same amount of money with fewer coins.

   Could she have 40¢? Explain your thinking.
   Could she have 56¢? Explain your thinking.
Adding and Subtracting with Coins

Complete the addition and subtraction diagrams and number sentences. Show each sum or difference with the fewest coins.

1. \[32¢ \quad 8¢\]

2. \[32¢ \quad 8¢\]

3. \[30¢ \quad 21¢\]

4. \[30¢ \quad 21¢\]
Complete the addition and subtraction diagrams. Show each sum or difference with the fewest coins.

**Challenge** Mara has 3 coins. She trades them all for 2 coins, but she has the same amount of money. Describe a trade that Mara could have made.

---

60 sixty LX 2 2 3 5
### Estimating Sums and Differences

#### NCTM Standards 1, 6, 7, 8, 9

Circle the correct answer.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. 35</td>
<td>C. 44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. 41</td>
<td>D. 45</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. 55</td>
<td>C. 58</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. 57</td>
<td>D. 65</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>193</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. 100</td>
<td>C. 183</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. 103</td>
<td>D. 283</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>200</td>
<td>375</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. 175</td>
<td>C. 575</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. 500</td>
<td>D. 695</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>363</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. 200</td>
<td>C. 311</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. 291</td>
<td>D. 415</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>497</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. 500</td>
<td>C. 550</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. 546</td>
<td>D. 600</td>
<td></td>
</tr>
</tbody>
</table>

Someone made a mistake!

\[
\begin{align*}
47 & \quad 38 \\
\underline{+} & \quad \underline{+} \\
85 & \\
\end{align*}
\]

**A** What mistake was made?  

____________________________________________________

**B** What is the correct answer? _____
Circle the correct answer.

Tony bought a model and a puzzle. He gave the clerk $1.00.

8 How much did Tony spend?
A. 22¢
B. 32¢
C. 41¢
D. 45¢

9 How much change did Tony get?
A. 12¢
B. 32¢
C. 68¢
D. 78¢

Mona bought 2 games, 2 puzzles, and 3 models. She received 3 pennies, 1 nickel, and 1 dime as change.

10 How much did Mona spend?
A. 98¢
B. $1.18
C. $1.22
D. $1.32

11 How much did she give the clerk?
A. $1.17
B. $1.35
C. $1.50
D. $1.60

Lester spent 36¢.

12 How much more did Mona spend than Lester?
A. 90¢
B. 96¢
C. $1.00
D. $1.04

13 Challenge
What did Lester buy?
A. 2 puzzles
B. 2 models
C. 2 games
D. 1 of each item
Problem Solving Strategy

Lesson 9

Work Backward

NCTM Standards 1, 2, 6, 7, 8, 9, 10

1. Complete the diagram.

Solve each problem.

2. Blake had some coins worth 45¢. He traded 6 of those coins for a dime. After the trade, he had the fewest possible coins to make 45¢. What coins did Blake start with?

3. Jan put some marbles in a blue box. She put the same number of marbles in a green box. Finally, she moved 5 marbles from the green box over to the blue box. If the blue box now has 18 marbles, how many marbles are in both boxes?

_____ marbles
Problem Solving Test Prep

Choose the correct answer.

1. Mr. Jones is putting new strings on 7 guitars at his store. He uses 6 strings for each guitar. How many strings will he use in all?
   - A. 6 strings
   - B. 13 strings
   - C. 42 strings
   - D. 48 strings

2. Which of the multiplication facts below can be used to find the missing number?
   50 č 10
   - A. 2 č 10 č 20
   - B. 10 č 5 č 50
   - C. 10 č 10 č 100
   - D. 10 č 50 č 500

3. Kenny used square tiles to model a number sentence.

What number sentence did he model?
   - A. 9 č 2 č 18
   - B. 5 č 5 č 5 č 15
   - C. 3 č 6 č 18
   - D. 6 č 6 č 36

4. Which is the missing factor?
   10 č (2 č ■) č 80
   - A. 1
   - B. 2
   - C. 3
   - D. 4

Show What You Know

Solve the problem. Explain your answer.

5. Chase made this pattern with counters.

Draw the next figure in Chase’s pattern. Explain how you know your answer is correct.

64 sixty-four  LXIV  2 ! 2 ! 2 ! 2 ! 2 ! 2
Complete the magic squares. Lesson 2

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>6</td>
<td></td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td></td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

Complete the table. Lesson 3

I have 36 green and blue marbles.

<table>
<thead>
<tr>
<th>If marbles are green, then marbles are blue.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
<tr>
<td>31</td>
</tr>
<tr>
<td>22</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

Find all the ways to make 23¢. What are the fewest coins needed to make 23¢? Lesson 6

<table>
<thead>
<tr>
<th>D</th>
<th>N</th>
<th>P</th>
<th>Number of Coins</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Complete the addition and subtraction diagrams and number sentences. Show each sum or difference with the fewest coins. **Lesson 7**

Shane had 3 coins worth 40¢. He traded the coin with the greatest value for 2 dimes and 1 nickel. He traded the coin with the least value for 5 pennies. What coins did Shane start with? **Lesson 9**

Circle the correct answer. **Lesson 8**

<table>
<thead>
<tr>
<th>43</th>
<th>A. 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>B. 25</td>
</tr>
<tr>
<td></td>
<td>C. 61</td>
</tr>
<tr>
<td></td>
<td>D. 71</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>73</th>
<th>A. 34</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>B. 44</td>
</tr>
<tr>
<td></td>
<td>C. 100</td>
</tr>
<tr>
<td></td>
<td>D. 110</td>
</tr>
</tbody>
</table>

66 sixty-six  LXVI  2  3  11
Write the missing amount. Shade the picture if you want.

1. 2 weeks, 3 days  
   - Days:
     - 7 days (SUN)  
     - 6 days (MON)  
     - 5 days (TUE)  
     - 4 days (WED)  
     - 3 days (THU)  
     - 2 days (FRI)  
     - 1 day (SAT)

2. 1 dime, 4 pennies  
   - Pennies:
     - 10¢ (10 coins)

3. 2 dimes, 3 pennies  
   - Pennies:
     - 20¢ (20 coins)

4. 1 dozen, 2 eggs  
   - Eggs:
     - 12 eggs (1 dozen)

5. 3 weeks, 4 days  
   - Days:
     - 7 days (SUN)  
     - 6 days (MON)  
     - 5 days (TUE)  
     - 4 days (WED)  
     - 3 days (THU)  
     - 2 days (FRI)  
     - 1 day (SAT)

6. 5 dozen, 3 eggs  
   - Eggs:
     - 60 eggs (5 dozen)
Use the fewest units to complete each row in the table.

### Table 7: Weeks and Days

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Days</th>
<th>Total days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22</td>
</tr>
</tbody>
</table>

### Table 8: Dimes and Pennies

<table>
<thead>
<tr>
<th>Dimes</th>
<th>Pennies</th>
<th>Total pennies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>61</td>
</tr>
</tbody>
</table>

### Table 9: Minutes and Seconds

<table>
<thead>
<tr>
<th>Minutes</th>
<th>Seconds</th>
<th>Total seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>109</td>
</tr>
<tr>
<td></td>
<td></td>
<td>135</td>
</tr>
</tbody>
</table>

### Challenge

<table>
<thead>
<tr>
<th>Time</th>
<th>Total minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 hour</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>89</td>
</tr>
</tbody>
</table>

**68 sixty-eight LXVIII 2 2 17**
Adding and Subtracting Money

Complete the table using the fewest units.

### Table 1
<table>
<thead>
<tr>
<th>Dimes</th>
<th>Nickels</th>
<th>Pennies</th>
<th>Total cents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>4</td>
<td>45</td>
</tr>
</tbody>
</table>

### Table 2
<table>
<thead>
<tr>
<th>Quarters</th>
<th>Nickels</th>
<th>Pennies</th>
<th>Total cents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>2</td>
<td>79</td>
</tr>
</tbody>
</table>

### Table 3
<table>
<thead>
<tr>
<th>Dollars</th>
<th>Dimes</th>
<th>Pennies</th>
<th>Total cents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>0</td>
<td>5</td>
<td>8</td>
<td>87</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>4</td>
<td>166</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>6</td>
<td>214</td>
</tr>
</tbody>
</table>

### Table 4
<table>
<thead>
<tr>
<th>Dollars</th>
<th>Quarters</th>
<th>Pennies</th>
<th>Total cents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>4</td>
<td>70</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>21</td>
<td>296</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td></td>
<td>337</td>
</tr>
</tbody>
</table>
Use the fewest coins to complete the table. You can use the table to find the missing sums.

<table>
<thead>
<tr>
<th>Dimes</th>
<th>Nickels</th>
<th>Pennies</th>
<th>Total cents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>71</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>87</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

**Challenge** Keegan spent 1 week and 5 days with her aunt and then 2 weeks and 4 days with her grandfather. How long was Keegan away?

\[
\text{weeks, days}
\]

**Challenge** The large desk is 3 feet 4 inches wide. The doorway is only 2 feet 8 inches wide. How much wider is the desk than the doorway?

\[
\text{feet, inches}
\]
For each group of blocks, decide if it matches the number and if it uses the fewest blocks to match it.

1. 85

Matches?   yes  no
Matches with fewest? yes  no

2. 124

Matches?   yes  no
Matches with fewest? yes  no

3. 38

Matches?   yes  no
Matches with fewest? yes  no

prime  LXXI  seventy-one 71
Write the number that matches the group of blocks.

number:  
[ ] rods, [ ] units

---

**Answer the questions about this group of blocks.**

231

---

5 How do you know this group of blocks does NOT use the fewest blocks?

---

6 What group of blocks uses the fewest blocks to show 231?

---

**Challenge** Omar started with 1 dollar, 8 dimes, and 3 pennies. Then he earned 1 quarter for doing a chore. How much money does Omar have? How can he write this amount using the fewest dollars, dimes, and pennies?

[ ] dollars, [ ] dimes, [ ] pennies

---

72 seventy-two LXXII  2  2  3  3
“Have fun,” said Mrs. Jackson.

“All these puzzles are about two-digit numbers.”

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I am greater than 24 4.</td>
<td>u!t (My units digit is less than my tens digit.)</td>
<td>I am odd.</td>
</tr>
<tr>
<td>2</td>
<td>t u</td>
<td>I am not an even number.</td>
<td>I am a multiple of 5.</td>
</tr>
<tr>
<td>3</td>
<td>I am less than 4 4.</td>
<td>I am a multiple of 5.</td>
<td>I am even.</td>
</tr>
<tr>
<td>4</td>
<td>I am less than 6 4.</td>
<td>I am greater than 7 3.</td>
<td>u t</td>
</tr>
</tbody>
</table>

You can use this space to make your lists.

1
2
3
4

5 One of the clues above says, “I am a multiple of 5.” What does this clue tell about the units (ones) digit of the mystery number?

prime LXXIII seventy-three 73
Some of these mystery numbers have 3 digits.

6 A I can be represented by 6 base-ten blocks.
   B t u
   C I am even.

7 A I am greater than 10 12.
   B I am a multiple of 25.
   C h t u

8 A I am less than 13 12.
   B t u
   C h ! t

9 Challenge
   A I am less than 20 20.
   B I am a square number.
   C u t
   D h u

You can use this space to make your lists.

6 7 8 9
Write the two-digit mystery number for each puzzle at the bottom of the page.

1 A Both my digits are odd.
   B I am less than 5 7.
   C u t

2 A I am greater than 7 9.
   B Both my digits are odd.
   C I can be made with 8 base-ten blocks.

3 A t is even.
   B I am a multiple of 10.
   C I am less than 7 4.

4 A I am between 7 5 and 7 7.
   B I am a multiple of 5.
   C u t

---

1  | 2  | 3  | 4  
---|----|----|----
0  | 0  | 0  | 0  
1  | 1  | 1  | 1  
2  | 2  | 2  | 2  
3  | 3  | 3  | 3  
4  | 4  | 4  | 4  
5  | 5  | 5  | 5  
6  | 6  | 6  | 6  
7  | 7  | 7  | 7  
8  | 8  | 8  | 8  
9  | 9  | 9  | 9  

3 5 5 LXXV seventy-five 75
Write the mystery number for each puzzle at the bottom of the page.

5 A I am less than 100.
   B I am odd.
   C I am a multiple of 11.
   D The sum of my digits is 10.

6 A I am less than 10
   B I am even.
   C The product of my digits is 42.

7 A I am between 12 and 17.
   B u t
   C I can only be made with more than 14 base-ten blocks
   D t ! 2 u

Challenge
A I am between 10 and 20.
B h u 3
C I am a square number.
D t h 2

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>u</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1 1</td>
<td></td>
</tr>
<tr>
<td>2 2</td>
<td></td>
</tr>
<tr>
<td>3 3</td>
<td></td>
</tr>
<tr>
<td>4 4</td>
<td></td>
</tr>
<tr>
<td>5 5</td>
<td></td>
</tr>
<tr>
<td>6 6</td>
<td></td>
</tr>
<tr>
<td>7 7</td>
<td></td>
</tr>
<tr>
<td>8 8</td>
<td></td>
</tr>
<tr>
<td>9 9</td>
<td></td>
</tr>
</tbody>
</table>

76 seventy-six  LXXVI  2  2  19
On your own piece of paper, you can make a diagram like the one shown below to help you solve the puzzle.

Remember that when you think there are just a few possible mystery numbers, list them all. Then look for ways to cross out numbers.

<table>
<thead>
<tr>
<th>A</th>
<th>I am an odd number.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>The product of my digits is 7.</td>
</tr>
<tr>
<td>C</td>
<td>( u ) ( t )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2</th>
<th>A</th>
<th>I am greater than 7 9.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>The product of my digits is 24.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>I have less than 9 groups of 10.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>I do not have two even digits.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>t is even.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>I am a multiple of 5.</td>
</tr>
<tr>
<td>C</td>
<td>( u ) ( t ) 11</td>
</tr>
<tr>
<td>D</td>
<td>I have 5 units.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4</th>
<th>A</th>
<th>I am between 7 5 and 7 7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>The product of my digits is 12.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>( u ) ( t )</td>
<td></td>
</tr>
</tbody>
</table>

7 11 LXXVII seventy-seven 77
5 A You can show me with a group of 9 base-ten blocks.
   B t u 18
   C t u
   D I am an odd number.

5 A I have more than 3 tens.
   B t u 8
   C I am a square number.

7 A You can show me with a group of 17 base-ten blocks.
   B I am a multiple of 10.
   C h t

8 Challenge
   A I am an even number.
   B h t 0
   C h u u
   D u 8

9 Describe how you solved one of the puzzles on page 77 or page 78.

78 seventy-eight LXXVIII △ 2 3 13
Draw a line to connect each number to its name. Not all names will be used.

1. 200  
   thirty thousand

2. 3,000  
   two thousand

3. 400  
   three hundred

4. 5,000  
   forty

5. 50  
   five thousand

6. 10,000  
   two hundred

7. 30,000  
   three thousand

8. 4,000  
   four hundred

9. 1,000  
   fifty

10. 900  
   four thousand

Prime LXXIX seventy-nine
Draw an X to show where each number would be. Fill in the numbers in the tags.

11 sixty

12 seven thousand

13 six hundred

14 Petra saw 280 birds on her nature hike. She rounds to the nearest hundred when she tells her mom how many birds she saw. What does Petra tell her mom she saw?

15 There are 47 third graders going on a field trip to the wildlife sanctuary. Round the number of third graders to the nearest ten.

Challenge Look at 23,578.

What digit is in the hundreds place?  
What digit is in the ten-thousands place?  
What digit is in the thousands place?

80 eighty LXXX 2 2 2 2 5
Problem Solving Strategy
Make an Organized List
NCTM Standards 1, 6, 7, 8, 9

1 Two sisters are nicknamed V and Z. They both just had birthdays. Use the clues to find their ages.

A Z is younger than 8 3.
B Z is older than V.
C V is older than 3 6.
D Their ages are both even.

V is ______ years old.
Z is ______ years old.

2 Three children in a family are nicknamed J, K, and L. Use the clues to find who is a sister and who is a brother.

A Only two of the children are boys.
B J is the brother of K.
C L is the brother of K.

J is a ______.
K is a ______.
L is a ______.
Problem Solving Test Prep
Choose the correct answer.

1 What is the difference between the largest two-digit number and the smallest two-digit number that can be made using the digits 3 and 9?
   A. 39  C. 54
   B. 45  D. 93

2 Colleen uses small cubes to make a staircase. The steps have these numbers of cubes: 3, 6, 9, and 12. If she keeps following her pattern and makes the staircase taller, how many cubes will she need for the sixth step?
   A. 18  C. 16
   B. 17  D. 15

3 Jackson buys 2 pens and pays 15¢ each for them. He now has 12¢. What is the smallest number of coins he could have had before he bought the pens?
   A. 4  C. 6
   B. 5  D. 7

4 Which of these numbers could be the answer to this puzzle?
   I am an even number greater than 40 and less than 60. What number am I?
   A. 40, 42, or 48
   B. 42, 48, or 55
   C. 46, 54, or 60
   D. 44, 50, or 58

Show What You Know
Solve each problem. Explain your answer.

5 Delroy can choose from vanilla or chocolate ice cream. He can have a 1 scoop or 2 scoops of the same flavor. Homer can choose from 3 flavors, but can have only 1 scoop. Who has more choices? How many more?

Maria has a black, a brown, and a blue pair of pants. She has a black and a brown sweater. She makes outfits with a pair of pants and a sweater. How many extra outfits can she make if she gets one more sweater?
Solve. Lessons 1 and 2

1. The school was having its fair in 2 weeks and 4 days. In how many days will the school be having its fair?

2. Sonya has 23 cents with only 3 pennies and the rest in nickels. How many nickels does Sonya have?

3. In 130 seconds, the bell will ring. After 2 minutes, how much more time will pass before the bell rings?

4. Maria received 2 quarters and 3 pennies in change. How much money does Maria have?

Write the number that matches each group of base-ten blocks. Lesson 3

5. number:

6. number:

Solve. Lesson 7

7. Round 6,679 to the nearest thousand.

8. Round 486 to the nearest hundred.

9. Round 81 to the nearest ten.

10. Round 121 to the nearest hundred.

11. Round 78,345 to the nearest ten thousand.

prime LXXXIII eighty-three 83
Find the mystery number. Lessons 4, 5, 6, and 8

Who Am I?
A. I am a two-digit number.
B. I am an even number.
C. My tens digit is 4 more than my ones digit.
D. The product of my tens and ones digit is 12.

You can use this space to make a list.

mystery number: 

Draw a line to connect each number to its name. Not all names will be used. Lessons 3 and 7

13 7,000
  six thousand
  six hundred

14 600
  five thousand
  seven thousand

15 20,000
  seventy thousand
  thirty thousand
  twenty thousand

16 5,000
  seven thousand, three hundred five

17 7,035
  seven thousand, thirty-five

84 eighty-four LXXXIV 2 2 3 7
Grouping by Tens

Write the number that matches each collection of base-ten blocks. Compare the collections using or .

1. [Diagram of base-ten blocks] 63

2. [Diagram of base-ten blocks] 1,307

3. [Diagram of base-ten blocks] 1,307

Compare the numbers using or .

4. 125 [ ] 152
5. 625 [ ] 526
6. 420 [ ] 402

7. 987 [ ] 1,142
8. 4,315 [ ] 4,135
9. 3,623 [ ] 3,632

10. 1,633 [ ] 6,133
11. 2,632 [ ] 2,623
12. 6,135 [ ] 6,136
13 List the numbers in order from least to greatest.

2,515  5,512  1,255  5,251  5,521  2,551

---

14 Explain how you decided on the order of the numbers in Problem 13.

---

15 Challenge Write the number shown by this collection of blocks.

---

16 Challenge Represent the number again using the fewest blocks.

---
Rounding to the Nearest Ten or Hundred

Label the multiples of 10 that surround each number. Circle the nearest multiple of 10.

1. 50 52

2. 

3. 

4. 37

5. 234 240

6. 

7. 151

8. 108

Label the multiples of 100 that surround each number. Circle the nearest multiple of 100.

9. 234

10. 300
Label the multiples of 10 that surround each number. In the boxes above the number lines, write the distance from the number to each multiple of 10. Circle the nearest multiple of 10.

11. 8 2
   60 68 70

12. 
   83

13. 
   341

14. 
   586

Label the multiples of 100 that surround each number. In the boxes above the number lines, write the distance from the number to each multiple of 100. Circle the nearest multiple of 100.

15. 
   220

16. 
   830

17. 
   245

18. 
   689

**Challenge** Round each number to the nearest ten.

67
6,789
678
67,891

88 eighty-eight
Finding Differences on the Number Line

For each subtraction sentence, draw jumps on the number line to help you find the difference.

1. \[35 \quad 19\]

2. \[51 \quad 35\]

3. \[51 \quad 19\]

4. \[62 \quad 24\]

5. \[100 \quad 62\]

Choose one of the problems above. Explain how you selected your stopping points.

Choose one of the problems above.

Explain how you selected your stopping points.
For each subtraction sentence, draw jumps on the number line to help you find the difference.

1. \(156 - 129\)  
2. \(345 - 307\)  
3. \(653 - 614\)  
4. \(504 - 462\)  
5. \(351 - 126\)  
6. \(232 - 89\)  

Challenge: \(1,000 - 368\)
Using Tens and Hundreds to Estimate Sums

NCTM Standards 1, 2, 6, 7, 8, 9

Circle the correct sentence.

1. 31 + 4
   - The sum is in the thirties. 
   - The sum is in the forties.

2. 22 + 9
   - The sum is in the twenties. 
   - The sum is in the thirties.

3. 14 + 53
   - The sum is in the sixties. 
   - The sum is in the seventies.

4. 67 + 25
   - The sum is in the eighties. 
   - The sum is in the nineties.

5. 39 + 38
   - The sum is in the sixties. 
   - The sum is in the seventies.

Write only the tens digit for each sum.

6. 15 + 4
   - 1

7. 18 + 4
   - 2

8. 13 + 8
   - 2

9. 28 + 1
   - 2

10. 14 + 6
    - 1

11. 12 + 8
    - 1

12. 17 + 7
    - 2

13. 22 + 7
    - 2

14. 18 + 7
    - 1

15. 14 + 9
    - 1

16. 16 + 9
    - 1

17. 31 + 6
    - 3

18. 39 + 9
    - 3

19. 50 + 9
    - 5

20. 47 + 9
    - 4

7 13

ninety-one 91
Circle the correct sentence.

20 329 418  The sum is in the 700s.  The sum is in the 800s.

22 162 152  The sum is in the 200s.  The sum is in the 300s.

23 571 335  The sum is in the 800s.  The sum is in the 900s.

24 425 258  The sum is in the 600s.  The sum is in the 700s.

25 361 195  The sum is in the 400s.  The sum is in the 500s.

Write only the hundreds digit for each sum.

26  7  3  8  
+  1  8  6

27  5  4  7  
+  5

28  2  1  0  
+  5  6  6

29  6  7  5  
+  2  5  7

30  1  4  3  
+  5  9  2

31  4  1  6  
+  9

32  3  8  4  
+  1  5

33  4  0  5  
+  4  7  7

34  3  2  7  
+  1  8  0

Challenge  If you only want to know the hundreds digit of a sum, would you ever need to look at the ones digits in the problem? Explain.
Estimate and Adjust to Find Sums

Show each sum with the fewest blocks. Then complete the number sentence.

1. \[
\begin{array}{c}
280 \\
+ 234 \\
\hline
\end{array}
\]

2. \[
\begin{array}{c}
327 \\
+ 240 \\
\hline
\end{array}
\]

3. \[
\begin{array}{c}
425 \\
+ 115 \\
\hline
\end{array}
\]

How did drawing the picture in Problem 3 help you to complete the number sentence?
Write only the hundreds digit for each sum.

5
A  3 6 6
+ 4 4 2

Write only the tens digit for each sum.

B  3 6 6
+ 4 4 2

Write only the ones digit for each sum.

C  3 6 6
+ 4 4 2

Find the sum.

8 366
+ 442

9 437
+ 245

10 186
+ 345

Challenge Find the missing addend.

\[
\begin{array}{c}
\square \\
+ 119 \\
\hline 143
\end{array}
\]

\[
\begin{array}{c}
\square \\
+ 134 \\
\hline 162
\end{array}
\]

94 ninety-four  !  2  47
Complete each Cross Number Puzzle and number sentence. The blocks in the bottom row of the puzzle may not always be the fewest blocks to match the total sum. You may want to draw another picture that shows fewest blocks.

<table>
<thead>
<tr>
<th></th>
<th>numbers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>+ 37</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2

<table>
<thead>
<tr>
<th></th>
<th>numbers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>409</td>
<td>+ 128</td>
<td></td>
</tr>
<tr>
<td>128</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3

<table>
<thead>
<tr>
<th></th>
<th>numbers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>162</td>
<td>+ 345</td>
<td></td>
</tr>
<tr>
<td>345</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4

<table>
<thead>
<tr>
<th></th>
<th>numbers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>236</td>
<td>+ 285</td>
<td></td>
</tr>
<tr>
<td>285</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Complete each Cross Number Puzzle.

5

\[
\begin{array}{ccc}
700 & 80 & 5 \\
100 & 60 & 9 \\
\end{array}
\]

6

\[
\begin{array}{ccc}
200 & 70 & 3 \\
500 & 30 & 7 \\
\end{array}
\]

7

\[
\begin{array}{ccc}
600 & 60 & 7 \\
100 & 60 & 5 \\
\end{array}
\]

8

\[
\begin{array}{ccc}
300 & 40 & 5 \\
200 & 50 & 7 \\
\end{array}
\]

9

\[
\begin{array}{ccc}
100 & 20 & 128 \\
100 & 6 & 186 \\
\end{array}
\]

10

\[
\begin{array}{ccc}
40 & 9 & 349 \\
200 & 7 & 277 \\
\end{array}
\]

Challenge

\[
\begin{array}{ccc}
80 & 3 & 683 \\
300 & 10 & 317 \\
\end{array}
\]

96 ninety-six ! 2 2 2 2 2 3
Using a Common Addition Algorithm

NCTM Standards 1, 2, 6, 9, 10

Show the sum using fewest blocks and complete the number sentence.

1

\[
\begin{array}{c}
\text{165} \\
+ 264 \\
\hline
\end{array}
\]

2

\[
\begin{array}{c}
\text{239} \\
+ 316 \\
\hline
\end{array}
\]

Complete the Cross Number Puzzle and the number sentence.

3

\[
\begin{array}{ccc}
\text{300} & \text{80} & \underline{387} \\
\hline
\text{0} & 9 & \underline{409} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\text{387} \\
+ 409 \\
\hline
\end{array}
\]

4

\[
\begin{array}{ccc}
\text{600} & \underline{2} & \text{642} \\
\hline
\text{90} & 4 & \underline{294} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\text{642} \\
+ 294 \\
\hline
\end{array}
\]

Find the sum.

5

\[
\begin{array}{c}
\text{628} \\
+ 145 \\
\hline
\end{array}
\]

6

\[
\begin{array}{c}
\text{285} \\
+ 333 \\
\hline
\end{array}
\]

7

\[
\begin{array}{c}
\text{549} \\
+ 228 \\
\hline
\end{array}
\]

prime ! ninety-seven 97
### Find the sum.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>489</td>
<td>+</td>
</tr>
<tr>
<td>9</td>
<td>193</td>
<td>+</td>
</tr>
<tr>
<td>10</td>
<td>452</td>
<td>+</td>
</tr>
</tbody>
</table>

### Solve.

11 In Lanh's school there are 367 girls and 349 boys. How many students go to Lanh's school? 

_____ students

12 It took two days to drive to grandma's house. On the first day, we drove 446 miles. On the second day, we drove 395 miles. How far is it to grandma’s? 

_____ miles

### Challenge

Akiko and Hiroshi were collecting pennies for the animal shelter. Hiroshi collected 234 pennies. Akiko collected twice as many pennies as Hiroshi. How much did they collect? 

_____ pennies
Show each difference. Then complete the number sentence.

1. \[ \begin{array}{c}
\Box\Box\Box \\
\Box\Box\Box
\end{array} \quad 514 \\
- \begin{array}{c}
\Box\Box\Box \\
\Box\Box\Box
\end{array} \\
\begin{array}{c}
\Box\Box\Box \\
\Box\Box\Box
\end{array}
\]

2. \[ \begin{array}{c}
\Box\Box\Box \\
\Box\Box\Box \\
\Box\Box\Box \\
\Box\Box\Box
\end{array} \quad 567 \\
- \begin{array}{c}
\Box\Box\Box \\
\Box\Box\Box
\end{array} \\
\begin{array}{c}
\Box\Box\Box \\
\Box\Box\Box
\end{array}
\]

3. \[ \begin{array}{c}
\Box\Box\Box \\
\Box\Box\Box \\
\Box\Box\Box \\
\Box\Box\Box
\end{array} \quad 540 \\
- \begin{array}{c}
\Box\Box\Box \\
\Box\Box\Box
\end{array} \\
\begin{array}{c}
\Box\Box\Box \\
\Box\Box\Box
\end{array}
\]

4. Did you make any exchanges to solve Problem 2? Explain.
<table>
<thead>
<tr>
<th></th>
<th>Write only the hundreds digit for each difference.</th>
<th>Write only the tens digit for each difference.</th>
<th>Write only the ones digit for each difference.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>A 8 0 8 - 3 6 6</td>
<td>B 8 0 8 - 3 6 6</td>
<td>C 8 0 8 - 3 6 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>A 6 8 2 - 2 4 5</td>
<td>B 6 8 2 - 2 4 5</td>
<td>C 6 8 2 - 2 4 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>A 5 3 1 - 1 8 6</td>
<td>B 5 3 1 - 1 8 6</td>
<td>C 5 3 1 - 1 8 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Find the difference.</td>
<td>Find the difference.</td>
<td>Find the difference.</td>
</tr>
<tr>
<td>8</td>
<td>808 - 366</td>
<td>682 - 245</td>
<td>531 - 186</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Challenge Find the missing number.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>143 - [ ] 119</td>
<td>162 - [ ] 134</td>
<td></td>
</tr>
</tbody>
</table>

100 one hundred C 2 2 5 5
Using Cross Number Puzzles to Subtract

NCTM Standards 1, 2, 6, 9, 10

Complete each Cross Number Puzzle and number sentence. You will not always be able to use the fewest blocks in the top row of the puzzle.

1. numbers

   |     | 66 |
   |     | 37 |
   |     |   |

   66
   − 37

2. numbers

   |     | 532 |
   | 11  | 128 |

   532
   − 128

3. numbers

   | 11  | 507 |
   |     | 345 |

   507
   − 345

4. numbers

   | 11  | 526 |
   | 11  | 284 |

   526
   − 284

prime CI one hundred one 101
Complete each Cross Number Puzzle.

5

<table>
<thead>
<tr>
<th></th>
<th>140</th>
<th>14</th>
<th>954</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>60</td>
<td>9</td>
</tr>
</tbody>
</table>

6

<table>
<thead>
<tr>
<th></th>
<th>700</th>
<th>10</th>
<th>810</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>70</td>
<td>3</td>
</tr>
</tbody>
</table>

7

<table>
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<tr>
<th></th>
<th></th>
<th></th>
<th>832</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>600</td>
<td>60</td>
<td>7</td>
</tr>
</tbody>
</table>

8

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>602</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>50</td>
<td>7</td>
</tr>
</tbody>
</table>

9

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>314</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>20</td>
<td>6</td>
</tr>
</tbody>
</table>

10

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>626</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>70</td>
<td>7</td>
</tr>
</tbody>
</table>

**Challenge**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>300</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>

102 one hundred two 2 3 17
Using a Common Subtraction Algorithm

Show the difference using base-ten blocks. Then complete the number sentence.

1. 429
   \[ \begin{array}{c}
   \text{square} \\
   \text{bars} \\
   \text{sticks} \\
   \text{units}
   \end{array} \]
   \[ \begin{array}{c}
   \text{square} \\
   \text{bars} \\
   \text{sticks} \\
   \text{units}
   \end{array} \]
   \[ \begin{array}{c}
   \begin{array}{c}
   429 \\
   - 264 \\
   \hline
   \end{array}
   \end{array} \]

2. 555
   \[ \begin{array}{c}
   \text{square} \\
   \text{bars} \\
   \text{sticks} \\
   \text{units}
   \end{array} \]
   \[ \begin{array}{c}
   \text{square} \\
   \text{bars} \\
   \text{sticks} \\
   \text{units}
   \end{array} \]
   \[ \begin{array}{c}
   \begin{array}{c}
   555 \\
   - 316 \\
   \hline
   \end{array}
   \end{array} \]

Complete the Cross Number Puzzle and the number sentence.

3. \[ \begin{array}{ccc}
   300 & 80 & 7 \\
   \hline
   796 & \text{ } & \text{ } \\
   \hline
   \text{ } & \text{ } & 387
   \end{array} \]
   \[ \begin{array}{c}
   \begin{array}{c}
   796 \\
   - 387 \\
   \hline
   \end{array}
   \end{array} \]

4. \[ \begin{array}{ccc}
   200 & 90 & 4 \\
   \hline
   936 & \text{ } & \text{ } \\
   \hline
   \text{ } & \text{ } & 294
   \end{array} \]
   \[ \begin{array}{c}
   \begin{array}{c}
   936 \\
   - 294 \\
   \hline
   \end{array}
   \end{array} \]

Find the difference.

5. 773
   \[ \begin{array}{c}
   \begin{array}{c}
   773 \\
   - 145 \\
   \hline
   \end{array}
   \end{array} \]

6. 618
   \[ \begin{array}{c}
   \begin{array}{c}
   618 \\
   - 285 \\
   \hline
   \end{array}
   \end{array} \]

7. 777
   \[ \begin{array}{c}
   \begin{array}{c}
   777 \\
   - 549 \\
   \hline
   \end{array}
   \end{array} \]

prime CIII one hundred three 103
Find the difference.

8
813
– 489

9
820
– 193

10
931
– 489

Solve.

There were 716 books sold at the fair. There were 349 hardbacks sold. The rest were paperbacks. How many paperbacks were sold?

_____ paperbacks

Write your own subtraction word problem. Write a number sentence to solve the problem.

Challenge Sally Ride Elementary School had 702 students. 328 of them brought lunch from home, and the rest bought lunch at school. Of the students who bought school lunch, 98 chose pizza and the rest chose tacos. How many students chose tacos?

_____ students
Problem Solving Strategy
Solve a Simpler Problem

The Pickle Factory workers pack 100 jars of pickles in every box. If Jo packed 473 jars of pickles before lunch and 658 jars after lunch, how many full boxes did she make?

1. **boxes**

2. Rod used small jumps on the number line to find the difference. What jumps might Rod have made?

3. Misha made the sum with fewest blocks. How many rods are in the sum?

---

**NCTM Standards** 1, 2, 6, 7, 8, 9, 10

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Problem Solving Test Prep

Choose the correct answer.

1. Which is the only number that is to the right of 593 on a number line?
   A. 490  
   B. 500  
   C. 590  
   D. 600  

2. Ariela buys 3 stickers for 7¢ each. She has 10¢ left. What is the fewest number of coins she could have had before she bought the stickers?
   A. 3  
   B. 4  
   C. 5  
   D. 7  

3. Jasmine is rounding numbers to the nearest hundred. Which is the largest number that she can round to 800?
   A. 851  
   B. 849  
   C. 750  
   D. 749  

4. Eric pays for a snack with coins. The amount he pays rounds to the same number when rounded to the nearest dime or the nearest dollar. Which is an amount he could pay?
   A. 90¢  
   B. 92¢  
   C. 94¢  
   D. 96¢  

Show What You Know

Solve each problem. Explain your answer.

5. Suki has more markers than Jake and fewer than Chelsea. Jake has 107 markers, and Chelsea has 118 markers. What is the largest number Suki can have? Explain.

6. Harris has these base-ten blocks.

   He wants to model subtracting 114 from the number shown. In which place or places will he have to regroup? Explain.
Chapter 5

Review/Assessment

NCTM Standards 1, 2, 6, 7, 9, 10

Compare the numbers using \(\leq\) or \(\geq\). Lesson 1

1. 4,328 \(\leq\) 3,428
2. 6,982 \(\geq\) 6,972
3. 982 \(\leq\) 1,023

4. 9,860 \(\leq\) 9,859
5. 4,238 \(\geq\) 4,328
6. 7,106 \(\leq\) 7,107

Label the multiples of 10 that surround each number. Circle the nearest multiple of 10. Lesson 2

7. 

8. 

Label the multiples of 100 that surround each number. Circle the nearest multiple of 100. Lesson 2

9. 

10. 

For the subtraction sentence, draw jumps on the number line to help you find the difference. Lesson 3

11. 

prime \(\text{CVII}\) one hundred seven 107
Write only the hundreds digit for each sum or difference.  

Lessons 4, 5  

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>9</td>
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</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Write only the tens digit for each sum or difference.  

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>7</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>7</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>7</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9</td>
<td>5</td>
</tr>
</tbody>
</table>

Write only the ones digit for each sum or difference.  

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Find the sum or difference.  

Lessons 7, 10  

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>158</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>225</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>487</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>136</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>560</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>−</td>
<td>231</td>
<td></td>
</tr>
</tbody>
</table>

Solve.  

Lesson 11  

17 Darin collected 132 cans for the school recycling drive. Martin collected 178 cans. Estimate to the nearest hundred the total number of cans the boys collected for the school recycling drive.  

18 Chi used a pedometer to count her steps. By 9:00 A.M., she had taken 683 steps. At 10:00 A.M., her new total was 946 steps. How many steps did Chi take between 9:00 A.M. and 10:00 A.M.?  

108 one hundred eight  CVIII  2  2  3  3  3
1. Complete the Find a Rule (FAR) card set.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>55</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td>D</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>20</td>
</tr>
<tr>
<td>F</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

2. Complete the FAR card set.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>△△ △△</td>
</tr>
<tr>
<td>C</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>△△△ △△△</td>
</tr>
<tr>
<td>E</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>△△△</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>△△△ △△△</td>
</tr>
<tr>
<td>D</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>△△ △△</td>
</tr>
<tr>
<td>F</td>
<td><strong>FRONT</strong></td>
</tr>
<tr>
<td></td>
<td>△△△ △△△</td>
</tr>
</tbody>
</table>

3. Look at the FAR cards from either Problem 1 or Problem 2. Write a rule for the cards.

prime  one hundred nine 109
These FAR cards show the number of tricycles and wheels. Complete the card with missing number.

<table>
<thead>
<tr>
<th></th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>E</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>6</td>
<td>18</td>
</tr>
</tbody>
</table>

Make a table to show the data on the cards.

Complete the sentence.

The front shows the number of ____________.

The back shows the number of ____________.

Challenge If you know the number of tricycles, how can you find the number of wheels?

If you know the number of tricycles, you can find the number of wheels by doubling the number of tricycles and adding three (because each tricycle has three wheels).
The graph shows how many pencils are in different numbers of boxes. Each box contains the same number of pencils. Use the graph to complete the Find a Rule cards below.
The FAR cards show the costs of different numbers of erasers. Complete the set of cards and then use the cards to complete the graph. Use a dot to mark a point on the graph for each card.

<table>
<thead>
<tr>
<th>ERASERS</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>6¢</td>
</tr>
<tr>
<td>2</td>
<td>4¢</td>
</tr>
<tr>
<td>6</td>
<td>12¢</td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Challenge** Erasers now cost twice as much. Mark the prices for 1, 2, 3, and 4 erasers on the graph above with an “x.”
1. Complete this set of Find a Rule cards.

   **A**
   
   **FRONT** | **BACK**
   4, 3 | 1

   **B**
   
   **FRONT** | **BACK**
   7, 2 | 5

   **C**
   
   **FRONT** | **BACK**
   10, 4 | 6

   **D**
   
   **FRONT** | **BACK**
   20, 5 |

   **E**
   
   **FRONT** | **BACK**
   17, 3 |

   **F**
   
   **FRONT** | **BACK**
   16, | 9

   **G**
   
   **FRONT** | **BACK**
   | 3 | 16

   **H**
   
   **FRONT** | **BACK**
   | 8 | 37

   **I**
   
   **FRONT** | **BACK**
   5, | 0

2. Complete this set of Find a Rule cards.

   **A**
   
   **FRONT** | **BACK**
   4, 3 | 7

   **B**
   
   **FRONT** | **BACK**
   6, 7 |

   **C**
   
   **FRONT** | **BACK**
   5, 9 | 14

   **D**
   
   **FRONT** | **BACK**
   7, 7 | 14

   **E**
   
   **FRONT** | **BACK**
   21, 11 |

   **F**
   
   **FRONT** | **BACK**
   | 5 | 23

3. Compare how you found the missing numbers on the back of the cards in Problem 1 to how you found the missing numbers on the back of the cards in Problem 2.

   prime  one hundred thirteen  113
4 Complete this set of Find a Rule cards.

A | FRONT | BACK |
---|------|------|
8, 2 | 16   |

D | FRONT | BACK |
---|------|------|
10, 5 | 50   |

G | FRONT | BACK |
---|------|------|
9, 9 |      |

B | FRONT | BACK |
---|------|------|
10, 2 |      |

E | FRONT | BACK |
---|------|------|
9, 3 | 27   |

H | FRONT | BACK |
---|------|------|
8, ___ | 32   |

I | FRONT | BACK |
---|------|------|
7, ___ | 49   |

5 Sonia collects spiders. Make a table to show the number of spider legs she might have in her collection.

If there are 48 legs, how many spiders are there? _____ spiders

6 Challenge Complete this set of Find a Rule cards.

A | FRONT | BACK |
---|------|------|
7, 3 | 14   |

D | FRONT | BACK |
---|------|------|
6, 4 | 14   |

B | FRONT | BACK |
---|------|------|
4, 8 | 16   |

E | FRONT | BACK |
---|------|------|
9, 12 |      |

C | FRONT | BACK |
---|------|------|
1, 12 | 17   |

F | FRONT | BACK |
---|------|------|
___, 5 | 19   |
Finding Rules with Parts and Wholes
NCTM Standards 1, 2, 6, 7, 8, 9, 10

1. Complete the Find a Rule cards.

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
</table>
| ![Diagram A](#) | Rule A: 1  
Rule B: 4 |
| ![Diagram B](#) | Rule A: 4  
Rule B: 8 |
| ![Diagram C](#) | Rule A: 1  
Rule B: 4 |
| ![Diagram D](#) | Rule A:     
Rule B:     |
| ![Diagram E](#) | Rule A:     
Rule B:     |
| ![Diagram F](#) | Rule A:     
Rule B: 16 |
| ![Diagram G](#) | Rule A:     
Rule B:     |
| ![Diagram H](#) | Rule A:     
Rule B:     |

© Education Development Center, Inc.
1. Complete the Find a Rule cards.

   **A**
<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule C</td>
<td>Rule D</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

   **B**
<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule C</td>
<td>Rule D</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>

   **C**
<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule C</td>
<td>Rule D</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

   **D**
<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule C</td>
<td>Rule D</td>
</tr>
<tr>
<td>_____</td>
<td>_____</td>
</tr>
</tbody>
</table>

   **E**
<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule C</td>
<td>Rule D</td>
</tr>
<tr>
<td>_____</td>
<td>_____</td>
</tr>
</tbody>
</table>

   **F**
<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule C</td>
<td>Rule D</td>
</tr>
<tr>
<td>_____</td>
<td>_____</td>
</tr>
</tbody>
</table>

2. Use pictures, numbers, or words to describe Rule C and Rule D.

   Rule C: __________

   Rule D: __________

3. Challenge: Use the rules to shade the front of the FAR card.

   **A**
<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule C</td>
<td>Rule D</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

   **B**
<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule C</td>
<td>Rule D</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>
Recording Rules with Fractions

1. Complete this set of Find a Rule cards.

<table>
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<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rule A</td>
<td>Rule B</td>
</tr>
<tr>
<td></td>
<td>$\frac{2}{4}$</td>
<td>$\frac{2}{4}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rule A</td>
<td>Rule B</td>
</tr>
<tr>
<td></td>
<td>$\frac{2}{5}$</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C</th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\frac{2}{3}$</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E</th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F</th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\frac{1}{8}$</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G</th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\frac{5}{7}$</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H</th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I</th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\frac{1}{3}$</td>
<td>$\frac{2}{3}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>J</th>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\frac{2}{2}$</td>
<td>$\frac{0}{2}$</td>
</tr>
</tbody>
</table>

3 3 13 ! one hundred seventeen 117
Complete this set of Find a Rule cards.

### A

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>⭐⭐⭐⭐</td>
<td>Rule C 3/10</td>
</tr>
<tr>
<td>⭐⭐⭐⭐</td>
<td>Rule D 5/10</td>
</tr>
</tbody>
</table>

### B

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>🔷🔷 🔷</td>
<td>Rule C 5/9</td>
</tr>
<tr>
<td>🔷🔷 🔷</td>
<td>Rule D 3/9</td>
</tr>
</tbody>
</table>

### C

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐☐☐</td>
<td>1/6</td>
</tr>
<tr>
<td>☐☐☐</td>
<td>5/6</td>
</tr>
</tbody>
</table>

### D

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>🔴🔴</td>
<td>2/4</td>
</tr>
</tbody>
</table>

### E

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐☐☐</td>
<td>2</td>
</tr>
</tbody>
</table>

### F

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>🔸🔸🔸</td>
<td>3/5</td>
</tr>
<tr>
<td>🔸🔸🔸</td>
<td>2/5</td>
</tr>
</tbody>
</table>

---

How are the sets of FAR cards on pages 117 and 118 different?

---

**Challenge** Complete this set of Find a Rule cards.

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/3</td>
<td>2/3</td>
</tr>
<tr>
<td>1/4</td>
<td>3/4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/5</td>
<td>2/5</td>
</tr>
<tr>
<td>4/6</td>
<td></td>
</tr>
</tbody>
</table>
Draw the next figure following the pattern. Use the grid below.

1

2

3
Complete the table to describe the next three figures following the pattern.

<table>
<thead>
<tr>
<th>Figure</th>
<th>Total tiles</th>
<th>Rows</th>
<th>Columns</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Figure</th>
<th>Total tiles</th>
<th>Green tiles</th>
<th>White tiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>15</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Lune was watching a kind of cell that splits into 2 new cells every hour. She started watching one cell under a microscope. After 4 hours, how many cells were there? _____ cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete the tables to show how the number of cells increases each hour.</td>
<td></td>
</tr>
<tr>
<td>Hours passed</td>
<td>0</td>
</tr>
<tr>
<td>Cells</td>
<td>1</td>
</tr>
</tbody>
</table>

120 one hundred twenty
The numbers in the grid are arranged to match the Number Line Hotel. Shade the landing numbers and then find a rule.

1. Start at 0.

<table>
<thead>
<tr>
<th>60</th>
<th>61</th>
<th>62</th>
<th>63</th>
<th>64</th>
<th>65</th>
<th>66</th>
<th>67</th>
<th>68</th>
<th>69</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>51</td>
<td>52</td>
<td>53</td>
<td>54</td>
<td>55</td>
<td>56</td>
<td>57</td>
<td>58</td>
<td>59</td>
</tr>
<tr>
<td>40</td>
<td>41</td>
<td>42</td>
<td>43</td>
<td>44</td>
<td>45</td>
<td>46</td>
<td>47</td>
<td>48</td>
<td>49</td>
</tr>
<tr>
<td>30</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>38</td>
<td>39</td>
</tr>
<tr>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Find a rule.

2. Start at 99.

<table>
<thead>
<tr>
<th>90</th>
<th>91</th>
<th>92</th>
<th>93</th>
<th>94</th>
<th>95</th>
<th>96</th>
<th>97</th>
<th>98</th>
<th>99</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>81</td>
<td>82</td>
<td>83</td>
<td>84</td>
<td>85</td>
<td>86</td>
<td>87</td>
<td>88</td>
<td>89</td>
</tr>
<tr>
<td>70</td>
<td>71</td>
<td>72</td>
<td>73</td>
<td>74</td>
<td>75</td>
<td>76</td>
<td>77</td>
<td>78</td>
<td>79</td>
</tr>
<tr>
<td>60</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td>66</td>
<td>67</td>
<td>68</td>
<td>69</td>
</tr>
<tr>
<td>50</td>
<td>51</td>
<td>52</td>
<td>53</td>
<td>54</td>
<td>55</td>
<td>56</td>
<td>57</td>
<td>58</td>
<td>59</td>
</tr>
<tr>
<td>40</td>
<td>41</td>
<td>42</td>
<td>43</td>
<td>44</td>
<td>45</td>
<td>46</td>
<td>47</td>
<td>48</td>
<td>49</td>
</tr>
<tr>
<td>30</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>38</td>
<td>39</td>
</tr>
</tbody>
</table>

Find a rule.
The grids are like the Number Line Hotel. Describe the pattern of shaded squares with at least 2 different rules.

1. ___________________________________________________________________

2. ___________________________________________________________________

---

**Challenge** Make your own pattern and write your rule.

1. ___________________________________________________________________

2. ___________________________________________________________________

122 one hundred twenty-two
Sharing Machine A shares objects equally between two people. Complete the table.

<table>
<thead>
<tr>
<th>Contents of Each Input Package</th>
<th>Number of Packages That Come Out</th>
<th>Contents of Each Output Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 cookies</td>
<td>2</td>
<td>6 cookies</td>
</tr>
<tr>
<td>8 dimes</td>
<td>2</td>
<td>11 erasers</td>
</tr>
<tr>
<td>_____erasers</td>
<td></td>
<td>9 carrots</td>
</tr>
<tr>
<td>14 plums</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Write a division sentence to show what the machine will do with 14 plums.

Sharing Machine B shares objects equally among three people. Complete the table.

<table>
<thead>
<tr>
<th>Contents of Each Input Package</th>
<th>Number of Packages That Come Out</th>
<th>Contents of Each Output Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____ cookies</td>
<td>3</td>
<td>6 cookies</td>
</tr>
<tr>
<td>33 bananas</td>
<td>3</td>
<td>8 crayons</td>
</tr>
<tr>
<td>27 toy trucks</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Write a division sentence to show what the machine will do with 27 toy trucks.
Numa opened a package and there were 7 marbles inside.

12 If the package came from machine A, how many marbles had been put in? _____ marbles

13 If the package came from machine B, how many marbles had been put in? _____ marbles

The setting for Sharing Machine C can be changed for the number of people who are sharing. Complete the table.

<table>
<thead>
<tr>
<th>Contents of Each Input Package</th>
<th>Number of Packages That Come Out</th>
<th>Contents of Each Output Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 12 prizes</td>
<td>2</td>
<td>6 prizes</td>
</tr>
<tr>
<td>15 _____ marbles</td>
<td>3</td>
<td>6 marbles</td>
</tr>
<tr>
<td>16 16 apples</td>
<td></td>
<td>8 apples</td>
</tr>
<tr>
<td>17 _____ video games</td>
<td>4</td>
<td>4 video games</td>
</tr>
<tr>
<td>18 _____ pickles</td>
<td>25</td>
<td>3 pickles</td>
</tr>
<tr>
<td>19 88 stickers</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>20 Challenge</td>
<td>42 toys</td>
<td>2 toys</td>
</tr>
</tbody>
</table>

124 one hundred twenty-four ! ! 2 2 31
Complete the price chart for items at the class store.

<table>
<thead>
<tr>
<th>NUMBER PURCHASED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
</tbody>
</table>

Which two items cost the same as one notebook? Use pictures, numbers, or words to explain how you can use this information to find the cost of different numbers of notebooks.

© Education Development Center, Inc.
Solve.

10 Shauna bought 42 tickets for the fair. Each ride costs 6 tickets. How many rides can she go on?

_____ rides

11 Ken bought 50 tickets for the fair. Each ride costs 6 tickets. How many rides can he go on?

_____ rides

12 Marina is baking cupcakes for a party. She wants to make as many cupcakes as possible. The recipe calls for 2 eggs for every 3 cups of flour. If Marina uses a whole bag of flour that contains 9 cups, how many eggs will she need?

_____ eggs

13 Pete finished a 42-page book in 6 days by reading the same number of pages every day. Next, he will read a book that is 35 pages long. If Pete keeps reading the same number of pages every day, how many days will it take Pete to finish this book?

_____ days

14 **Challenge** A certain card game, with its own special deck, requires that all players start with an equal number of cards. Players must share all the cards in the deck. This game can be played by 2, 4, or 5 players. There are fewer than 30 cards in this special deck. How many cards are there?

_____ cards
1. Find a rule for this unusual machine and complete the table.

<table>
<thead>
<tr>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image]</td>
<td>![Output Image]</td>
</tr>
<tr>
<td>8</td>
<td>![Output Image]</td>
</tr>
<tr>
<td>3</td>
<td>![Output Image]</td>
</tr>
<tr>
<td>4</td>
<td>![Output Image]</td>
</tr>
<tr>
<td>6</td>
<td>![Output Image]</td>
</tr>
<tr>
<td>11</td>
<td>![Output Image]</td>
</tr>
</tbody>
</table>

2. Write a rule for the machine.

...
3. Find a rule for this new machine and complete the table.

<table>
<thead>
<tr>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>30¢</td>
<td>two apples and 10¢</td>
</tr>
<tr>
<td>37¢</td>
<td>two apples and 17¢</td>
</tr>
<tr>
<td>68¢</td>
<td>two apples and 48¢</td>
</tr>
<tr>
<td>45¢</td>
<td>two apples and _____ ¢</td>
</tr>
<tr>
<td></td>
<td>one apple and 6¢</td>
</tr>
<tr>
<td></td>
<td>two apples and 37¢</td>
</tr>
<tr>
<td>10¢</td>
<td></td>
</tr>
<tr>
<td>23¢</td>
<td></td>
</tr>
<tr>
<td>77¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>two apples and 84¢</td>
</tr>
</tbody>
</table>

4. **Challenge** Tory had 78¢, and then she spent 59¢ at the store. She found a nickel on the way out of the store. Does she have enough money to buy an orange for 23¢? Explain.

   _________________________________________
   _________________________________________
   _________________________________________
   _________________________________________
Solve each problem.

1. Shivani’s parents use a pattern to decide the weekly allowance that she will be paid during a year. The table shows the weekly allowance she has been paid at each age since she was 5 years old. How much allowance will Shivani receive each week when she is 10 years old?

<table>
<thead>
<tr>
<th>Age</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowance</td>
<td>$1</td>
<td>$3</td>
<td>$6</td>
<td>$10</td>
<td>$15</td>
<td></td>
</tr>
</tbody>
</table>

2. Cindy adds to her garden each year. The first year, her garden had 2 rows of 3 plants and looked like the garden on the right.

Each year, she adds another row. How many plants will she have the fourth year?

_____ plants

3. Timothy and his friends went on a week-long biking trip. They biked 15 miles on the first day. On each of the remaining 6 days, they biked 20 miles. The table shows the total number of miles the friends biked by the end of each day. How many miles long was their trip? Complete the table.

<table>
<thead>
<tr>
<th>Day</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of miles biked</td>
<td>15</td>
<td>35</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

_____ miles
Problem Solving Test Prep

Choose the correct answer.

1. The flower shop sold 396 red roses and 229 pink roses this month. Which is the best estimate for the number of roses the flower shop sold this month?
   A. 200  
   B. 400  
   C. 600  
   D. 700

2. Donald buys a snack and receives the coins shown below in change. What is the total value of the coins?
   A. 72¢  
   B. 82¢  
   C. 87¢  
   D. 95¢

3. Bianca has 7 equal rows of stamps. She has 42 stamps in all. Which number sentence can be used to find the number of stamps in each row?
   A. 7  42  
   B. 7  42  
   C. 42  7  
   D. 42  7

4. Tina buys 5 puzzles. Lorenzo buys 6 puzzles. How much do they pay?

<table>
<thead>
<tr>
<th>Puzzles</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$12</td>
<td>$18</td>
<td>$24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   A. $30, $36  
   B. $28, $32  
   C. $26, $28  
   D. $25, $26

Show What You Know

Solve the problem. Explain your answer.

5. Jamal made this pattern with square tiles. Draw the next figure in Jamal’s pattern.

   130 one hundred thirty  CXXX  2 ! 5 ! 13
The table describes a set of Find a Rule cards. Find a rule and complete the table. Lessons 1 and 3

1

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

2

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Complete the set of Find a Rule cards. Lesson 4

3

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rule A 2</td>
</tr>
<tr>
<td></td>
<td>Rule B 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rule A 4</td>
</tr>
<tr>
<td></td>
<td>Rule B 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rule A 1</td>
</tr>
<tr>
<td></td>
<td>Rule B 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rule A</td>
</tr>
<tr>
<td></td>
<td>Rule B 5</td>
</tr>
</tbody>
</table>

4 Continue the pattern by shading the fourth and fifth grids. Lesson 6

prime

one hundred thirty-one 131
The numbers in the grid are arranged to match the Number Line Hotel. Find a rule and shade the landing numbers.  

| 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |

Find a rule.

Sharing Machine A shares objects equally between 2 people. Complete the table.

<table>
<thead>
<tr>
<th>SHARING MACHINE A</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT</td>
</tr>
<tr>
<td>6 quarters</td>
</tr>
<tr>
<td>20 cookies</td>
</tr>
<tr>
<td>12 raisins</td>
</tr>
<tr>
<td>15 pretzels</td>
</tr>
<tr>
<td>14 marbles</td>
</tr>
</tbody>
</table>

Write a division sentence to show what Sharing Machine A will do with 18 apples.

Solve.

Todd has 24 trading cards. The cards are in packs of 8. How many packs of cards does Todd have?

Amy gave her sister 2 pennies on Monday. On Tuesday, she gave her sister 4 pennies. On Wednesday, she gave her sister 8 pennies. If the pattern continues, on which day of the week will Amy give her sister 64 pennies?
Label each piece of the bar with a fraction.

Separate this bar into 12 equal pieces. Label each piece.

Why is the green piece not a fifth of this figure?

one hundred thirty-three 133
Show the fractions on the grids.

4 Draw lines to cut the figure into fourths. Shade 3 fourths.

5 Draw lines to cut the figure into fifths. Shade 2 fifths.

6 Draw lines to cut the figure into fifths. Shade 4 fifths.

7 Draw lines to cut the figure into fourths. Shade 2 fourths.

8 Draw lines to cut the figure into sixths. Shade 3 sixths.

9 Draw lines to cut the figure into fifths. Shade 3 fifths.

10 Challenge Figure A was cut from figure B. It is one fifth of figure B. Draw what figure B could look like.

134 one hundred thirty-four
# Making Equivalent Fractions

The diagram above shows: 1 \(\frac{2}{2}\) 2 \(\frac{3}{3}\) 3 \(\frac{4}{4}\) 4 \(\frac{6}{6}\) 5 \(\frac{12}{12}\) 6

Some groups of bars are the same as some other groups. Label each fraction piece.

### 2

The diagram shows:

\[
\begin{array}{c}
\frac{1}{2} \\
\frac{1}{4} \\
\frac{1}{6}
\end{array}
\]

### 3

The diagram shows:

\[
\begin{array}{c}
\frac{1}{3} \\
\frac{1}{6}
\end{array}
\]

One hundred thirty-five 135
The large diagram above shows:

The diagram shows: $\frac{2}{3}$

The diagram shows: $\frac{1}{3}$

The diagram shows: $\frac{1}{6}$

The diagram shows: $\frac{5}{6}$

Challenge: How did you find your answer?

136 one hundred thirty-six
Alice has some bags of marbles. Each bag has 4 marbles, and 3 of the 4 marbles are green.

<table>
<thead>
<tr>
<th>Number of green marbles</th>
<th>Number of Alice’s marbles</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>16</td>
</tr>
</tbody>
</table>

Ben has bags with 3 marbles. Each bag contains 2 green marbles.

<table>
<thead>
<tr>
<th>Number of green marbles</th>
<th>Number of Ben’s marbles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>

In Kathryn’s bags, 5 of the 6 marbles are green.

<table>
<thead>
<tr>
<th>Number of green marbles</th>
<th>Number of Kathryn’s marbles</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>15</td>
<td>24</td>
</tr>
</tbody>
</table>

Paul has bags with 9 marbles. Each bag contains 7 green marbles.

<table>
<thead>
<tr>
<th>Number of green marbles</th>
<th>Number of Paul’s marbles</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>21</td>
<td>36</td>
</tr>
<tr>
<td>28</td>
<td>45</td>
</tr>
</tbody>
</table>

prime    !!!    one hundred thirty-seven 137
Nina has 60 stickers, and 1 of every 10 stickers has glitter. How many stickers with glitter does Nina have?

______ stickers with glitter

---

**Nina arranges her 60 stickers in an album. She puts 3 big stickers and 2 small stickers on each page.**

6 How many pages does she fill?

______ pages

---

7 How many small stickers does she have?

______ small stickers

---

8 How many big stickers does she have?

______ big stickers

---

**Challenge** In 5 bags, there are a total of 150 marbles. Each bag has the same number of marbles. How many marbles would there be in 8 bags if the number of marbles in each bag remains the same?

______ marbles

---

138 one hundred thirty-eight
Frank works in a candy shop. He sells two kinds of bags of candy: choco-mint bags and chewy bags. In choco-mint bags there is 1 chocolate for every 4 peppermints. In chewy bags there are 2 licorice sticks for every 3 gumdrops. The store offers different-size bags. Complete the chart to show how many pieces of each type of candy Frank needs for different bags.

<table>
<thead>
<tr>
<th></th>
<th>Number of chocolates</th>
<th>Number of peppermints</th>
<th>Number of licorice sticks</th>
<th>Number of gumdrops</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>10</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Frank needs to make a choco-mint bag with 50 pieces of candy. How many of each type of candy does he need?

_____ chocolates

_____ peppermints

Jackie bought a bag with 8 licorice sticks. Her sister bought a bag with 9 gumdrops. Did they buy bags of the same size?

prime

one hundred thirty-nine 139
7 The Sports Store sells 6 golf balls for $1.50. The Athletic Store sells 4 golf balls for 80¢.

A How much do 12 golf balls cost at the Sports Store? $ ____(). 
B How much do 12 golf balls cost at the Athletic Store? $ ____(). 
C At these prices, which store has the better deal for 10 golf balls? How do you know? ____________________________________________

8 The grocery store sells 8 ounces of juice for $1.60. The fruit stand sells 12 ounces of juice for $3.00. Which store has the better deal per ounce? Why?
__________________________________________
__________________________________________
__________________________________________

9 Challenge A pound of apples costs $2.80. How much do \( \frac{1}{2} \) pounds of apples cost?

$ ____().
Comparing Fractions in Context

Answer the question. Then write , , or .

1. Does 1 half dollar buy more than, less than, or the same as 3 quarters?

   \[
   \frac{1}{2} \quad \boxed{3} \quad \boxed{4}
   \]

2. A day is one seventh of a week.

   \[
   \begin{array}{ccccccc}
   & & & & & \text{Sun} & \\
   & & & & & \text{Mon} & \\
   & & & & & \text{Tue} & \\
   & & & & & \text{Wed} & \\
   & & & & & \text{Thu} & \\
   & & & & & \text{Fri} & \\
   & & & & & \text{Sat} & \\
   \hline
   & & & & & 1 & \\
   & & & & & 2 & \\
   & & & & & 3 & \\
   & & & & & 4 & \\
   & & & & & 5 & \\
   & & & & & 6 & \\
   & & & & & 7 & \\
   \end{array}
   \]

   Is five sevenths of a week greater than, less than, or equal to 3 days?

   \[
   \frac{5}{7} \quad \boxed{3} \quad \boxed{7}
   \]

Complete each fraction.

3. Two quarters of an hour is the same as \boxed{ } of an hour.

   \[
   \frac{2}{4}
   \]

4. Two thirds of a pie is the same as \boxed{ } of a pie.

   \[
   \frac{2}{3}
   \]
5 One egg is \( \frac{1}{12} \) of a dozen eggs.

Is nine twelfths of a dozen greater than, less than, or the same as one third of a dozen?

\[
\frac{9}{12} \quad \square \quad \frac{1}{3}
\]

Is nine twelfths of a dozen greater than, less than, or the same as two thirds of a dozen?

\[
\frac{9}{12} \quad \square \quad \frac{2}{3}
\]

6 Which buys more: 1 dollar and 3 quarters, or 4 half dollars?

\[
1 \frac{3}{4} \quad \square \quad \frac{4}{2}
\]

7 Challenge Compare \( \frac{3}{10} \) and \( \frac{1}{2} \). Write a story or draw a picture about money to help you.

\[
\frac{3}{10} \quad \square \quad \frac{1}{2}
\]
Comparing Fractions

Fill in the table to show the number of minutes or the fraction of an hour. You can use the pictures of clocks to help you.

<table>
<thead>
<tr>
<th>Fraction of an Hour</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>1/4</td>
<td></td>
</tr>
<tr>
<td>1/5</td>
<td></td>
</tr>
<tr>
<td>1/10</td>
<td>10</td>
</tr>
<tr>
<td>1/60</td>
<td>5</td>
</tr>
<tr>
<td>2/3</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>5/6</td>
<td></td>
</tr>
</tbody>
</table>

Compare the fractions using , , or .

12 1/3 0 1/5 13 1/2 0 2/3 14 2/3 0 5/6

one hundred forty-three 143
You may label the white bars to help you compare the fractions below.

<table>
<thead>
<tr>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{2}$</td>
</tr>
<tr>
<td>$\frac{1}{3}$</td>
</tr>
<tr>
<td>$\frac{1}{4}$</td>
</tr>
<tr>
<td>$\frac{1}{5}$</td>
</tr>
<tr>
<td>$\frac{1}{6}$</td>
</tr>
<tr>
<td>$\frac{1}{8}$</td>
</tr>
<tr>
<td>$\frac{1}{9}$</td>
</tr>
<tr>
<td>$\frac{1}{12}$</td>
</tr>
</tbody>
</table>

Compare the fractions using $\leq$, $\geq$, or $\approx$.

1. $\frac{1}{3} \quad \square \quad \frac{1}{2}$
2. $\frac{1}{9} \quad \square \quad \frac{1}{8}$
3. $\frac{1}{4} \quad \square \quad \frac{1}{6}$
4. $\frac{1}{2} \quad \square \quad \frac{1}{4}$
5. $\frac{2}{5} \quad \square \quad \frac{1}{4}$
6. $\frac{2}{4} \quad \square \quad \frac{1}{2}$
7. $\frac{3}{9} \quad \square \quad \frac{2}{3}$
8. $\frac{3}{5} \quad \square \quad \frac{1}{2}$
9. $\frac{3}{8} \quad \square \quad \frac{3}{9}$
10. $\frac{6}{9} \quad \square \quad \frac{6}{8}$
11. $\frac{6}{12} \quad \square \quad \frac{1}{2}$

**Challenge**

12. $\frac{3}{4} \quad \square \quad \frac{3}{5}$
13. $\frac{3}{5} \quad \square \quad \frac{3}{6}$
14. $\frac{3}{6} \quad \square \quad \frac{3}{9}$
15. $\frac{2}{3} \quad \square \quad \frac{3}{4}$
16. $\frac{3}{4} \quad \square \quad \frac{4}{5}$
17. $\frac{4}{5} \quad \square \quad \frac{5}{6}$

144 one hundred forty-four
Problem Solving Strategy
Make a Model
NCTM Standards 1, 2, 6, 7, 8, 9, 10

1. Carol has 20 buttons. \( \frac{1}{5} \) of the buttons are red, \( \frac{2}{5} \) are white, and the rest are black. How many buttons of each color does Carol have?

<table>
<thead>
<tr>
<th>_____ red</th>
<th>_____ white</th>
<th>_____ black</th>
</tr>
</thead>
</table>

2. Guy’s parents bought 2 dozen eggs to prepare for the class bake sale. They used \( \frac{1}{3} \) of the eggs to bake cakes and \( \frac{1}{4} \) of the eggs to bake brownies. They used the rest of the eggs to bake cookies. How many eggs did Guy’s parents use for each type of treat?

<table>
<thead>
<tr>
<th>_____ eggs for cakes</th>
<th>_____ eggs for brownies</th>
<th>_____ eggs for cookies</th>
</tr>
</thead>
</table>

3. Ory has a collection of 28 coins. 2 out of every 7 coins are nickels, 3 out of every 7 coins are quarters, and the rest are foreign coins. How many coins are from foreign countries?

<table>
<thead>
<tr>
<th>_____ coins</th>
</tr>
</thead>
</table>
Problem Solving Test Prep

Choose the correct answer.

1. Which output completes the table?

<table>
<thead>
<tr>
<th>INPUT</th>
<th>6</th>
<th>2</th>
<th>9</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPUT</td>
<td>13</td>
<td>9</td>
<td>16</td>
<td>4</td>
</tr>
</tbody>
</table>

A. 20  C. 11
B. 17  D. 8

2. Georgia named 7 songs as her favorites. Cory named 6 more than Georgia. Which number sentence shows how many they chose together?

A. 7 6 " 1
B. 13 7 " 20
C. 13 7 " 6
D. 6 7 " 13

3. Terry shares 32 stickers with 7 friends. He gives the same amount to each friend and to himself. Which expression tells how Terry shares his stickers?

A. 32 \div 7
B. 32 \div 8
C. 32 \div 4
D. 32 \times 7

4. The mystery number

P is greater than 70 but less than 90.
P \in \{7, 8, 9\}
P \notin \{7, 8\}

Which number could NOT be the mystery number?

A. 73  C. 77
B. 75  D. 81

Show What You Know

Solve the problem. Explain your answer.

5. Jenna has 12 miles to walk. She plans to walk half of it before lunch, half of what is left after lunch, and the rest after dinner. How far will she walk after dinner? Explain.

6. Tim and Carlo each have 18 potatoes to peel. Tim has peeled \(\frac{2}{3}\) of his potatoes. Carlo divides his potatoes into 2 equal groups. He has peeled 1 group. Who has peeled more potatoes? Explain.
1. Label each piece of the bar with the fraction of the top bar that it represents. **Lesson 1**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/2</td>
<td>1/3</td>
<td>1/3</td>
<td></td>
</tr>
</tbody>
</table>

**Compare the fractions using \(\leq, \geq\), or \(=\). ** **Lesson 6**

2. \(\frac{1}{3} \quad \frac{2}{3}\)
3. \(\frac{1}{6} \quad \frac{1}{4}\)
4. \(\frac{2}{6} \quad \frac{3}{12}\)

**Complete the fractions. ** **Lesson 2**

5. \(\frac{3}{2}\)
6. \(\frac{9}{12}\)
7. \(\frac{2}{3}\)

8. **Complete the chart. ** **Lessons 3 and 4**

Jen has some bags of rocks. Each bag has 8 rocks, and 3 of the 8 rocks are smooth.

<table>
<thead>
<tr>
<th>Number of smooth rocks</th>
<th>1 bag</th>
<th>2 bags</th>
<th>3 bags</th>
<th>4 bags</th>
<th>5 bags</th>
<th>6 bags</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of rocks</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Answer the question. Then write , , or !. Lesson 5

Is one third of an hour less than, greater than, or equal to three quarters of an hour?


Do 2 quarters buy more than, less than, or the same as 3 dimes?


The third graders were asked if they like soccer or basketball better. Fifteen students chose soccer. That was 3 out of every 5 students in third grade. How many students are in third grade? Lesson 7
Introducing Pictographs

Each student in Ms. Tanaka’s class was asked, “What is your favorite fruit?” Use the pictograph to answer questions about this survey.

1. What fruit did most students pick for their favorite?

2. How many more students picked apple than picked orange for their favorite fruit?

3. Which fruit was chosen as favorite by the fewest students?

4. How many students are in Ms. Tanaka’s class?

5. What can you say for sure about the fruit preferences of Ms. Tanaka’s class?

6. How many pieces of fruit does Ms. Tanaka’s class eat each day?
   - A. 28
   - B. 15
   - C. 0
   - D. Do not know
Use the information below to complete the pictograph of favorite drinks.

15 people completed the survey.

Water was the least popular drink.

8 people liked milk best.

3 more people liked milk best than liked juice best.

2 people liked iced tea best.

<table>
<thead>
<tr>
<th>FAVORITE DRINK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
</tr>
<tr>
<td>Water</td>
</tr>
<tr>
<td>Juice</td>
</tr>
<tr>
<td>Iced Tea</td>
</tr>
</tbody>
</table>

---

**Challenge**

From the pictograph, what can you say?

<table>
<thead>
<tr>
<th>WHAT INSTRUMENT DO YOU PLAY?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piano</td>
</tr>
<tr>
<td>Guitar</td>
</tr>
<tr>
<td>Violin</td>
</tr>
<tr>
<td>Trumpet</td>
</tr>
</tbody>
</table>
Making Pictographs

The pictograph shows data from a survey taken at the library.

<table>
<thead>
<tr>
<th>FAVORITE TYPE OF BOOK</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonfiction</td>
<td>![Nonfiction pictogram]</td>
</tr>
<tr>
<td>Science fiction</td>
<td>![Science fiction pictogram]</td>
</tr>
<tr>
<td>Historical fiction</td>
<td>![Historical fiction pictogram]</td>
</tr>
<tr>
<td>Fantasy</td>
<td>![Fantasy pictogram]</td>
</tr>
</tbody>
</table>

Key: Each 📚 = 10 people.

1. Of the people who answered the survey, how many chose fantasy as their favorite type of book? _________

2. How many chose historical fiction as their favorite? _________

3. How many more people chose fantasy as their favorite than chose science fiction? _________

4. How might the librarian use the results of the survey when choosing new books to order?

5. Can you say anything about the number of books checked out of the library this year? Explain.

© Education Development Center, Inc.
Use the information below to complete the pictograph.

200 people completed the survey.
SUVs are driven by the most people.
Station wagons are the least popular.
30 more people drive SUVs than drive pick-up trucks.
50 people drive pick-up trucks.
40 fewer people drive station wagons than drive pick-up trucks.

**Challenge**

What are three questions you can answer from the pictograph?

1. ________________
2. ________________
3. ________________

**WHAT DO YOU DRIVE?**

<table>
<thead>
<tr>
<th>Compact car</th>
<th>SUV</th>
<th>Pick-up truck</th>
<th>Station wagon</th>
</tr>
</thead>
</table>

Key: Each C = 10 cars.
40 third graders answered a survey about their favorite way to exercise. The bar graph shows the data.

1. How many students chose walking?

2. How many students chose jumping rope?

3. How many more students chose soccer than chose biking?

4. What can you say for sure about the exercise preferences of the students in the survey?

5. Can you say anything for sure about the number of students who exercise at least 30 minutes a day? Explain.
600 students were asked to choose one way they would like to help protect the environment. Use the information below to complete the bar graph.

280 students want to recycle.

Half as many students chose to save water as chose to recycle.

One tenth of the students want to raise money to protect the rain forest.

55 students want to plant trees.

**Challenge** What are three questions you can answer from the bar graph?

- 
- 
-
Imagine you toss two number cubes, one blue and one green, and find the sum of the results.

1. What sum is most likely? Prediction: ____

2. What results are possible for . . .
   - the blue cube? ____________
   - the green cube? ____________

3. What sums are possible? __________________________

4. Complete the table at right to show the sum for each pair of results.

   | The Number on the Blue Cube
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. How many ways are there to get a total of . . .
   - 3? ____
   - 5? ____
   - 7? ____

6. Which sum is most likely? Explain.

   ____________________________
Maryann tossed two number cubes 20 times and wrote the sum each time. Here are her results:

5, 7, 7, 9, 6, 8, 8, 5, 7, 6, 8, 12, 7, 5, 9, 4, 11, 10, 10, 12

7 Complete the bar graph of Maryann’s sums.

<table>
<thead>
<tr>
<th>Sum</th>
<th>Number of Times Tossed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

8 Which sum(s) occurred most often?

9 Which sum(s) occurred least often?

10 Using the table on the previous page, which sum would you expect to occur more often: 11 or 12?

Which of those two sums occurred more often for Maryann?

11 Challenge Imagine a bag containing 3 green marbles, 2 blue marbles, and 1 red marble. If you reach in without looking and take 2 marbles, what colors could they be? List all the possibilities.
Imagine that you toss two coins: a penny and a nickel. Each coin shows either heads or tails. You record the number of heads.

1 What number of heads do you think is most likely? Prediction: _____

2 Complete the table to show the number of heads for each pair of possible results.

<table>
<thead>
<tr>
<th>penny shows</th>
<th>nickel shows</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>T</td>
<td>T</td>
</tr>
</tbody>
</table>

3 How many ways are there to get . . .

0 heads? _____ 1 head? _____ 2 heads? _____

4 Toss a nickel and a penny 20 times and record the number of heads each time by making a tally mark in the correct row of this table.

<table>
<thead>
<tr>
<th>heads</th>
<th>tally mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

5 Which number of heads occurred most often for you?
Imagine that you toss three coins: a penny, a nickel, and a dime. You record the number of heads each time.

6 Complete the table to show each possible result and the total number of heads.

<table>
<thead>
<tr>
<th>Penny</th>
<th>Nickel</th>
<th>Dime</th>
<th>Number of Heads</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>H</td>
<td>H</td>
<td>3</td>
</tr>
<tr>
<td>H</td>
<td>H</td>
<td>T</td>
<td>2</td>
</tr>
</tbody>
</table>

7 Is 0 heads more likely than 1 head? Explain.

8 Is 1 head more likely than 2 heads? Explain.

9 Challenge Is it more likely the penny will show heads than the nickel will show heads? Explain.
Making and Using a Price Chart

What is the total cost of 1 pencil and 1 eraser during the sale?

Jimmy spent 13¢. What did he buy?

Could you spend exactly 19¢?

What purchase costs 15¢?

What could you buy with exactly 1 dime?

What would you buy if you wanted the most items possible?

How much would you spend if you buy as many items as possible?

Limit: no more than 3 of each item to a customer.
Alice gave the cashier 1 dime and 1 nickel. She received 1¢ in change. How much did she spend?

What could she buy for that amount?

How much would it cost to buy 2 pencils and 3 erasers?

What coins could you use to pay that exact amount?

Mary gave the cashier 1 quarter and got 1 dime and 4 pennies in change. How much did she spend?

What could she buy for that amount?

Ali gave the cashier 2 coins and did not get change back. Tell whether each purchase is possible, and if so, what 2 coins Ali used.

Could Ali have bought 2 erasers?

Could Ali have bought 1 pencil and 2 erasers?

Could Ali have bought 2 pencils?

**Challenge** Erin has enough money to buy 3 pencils and 2 erasers, but not enough money to buy another eraser. How much money could she have?

160 one hundred sixty
Finding Locations on a Map

Write each person’s name in the correct box on the map.

1. Jack’s house is in A3.
2. Stacy lives between Jack and the school.
5. On the map, Adrine’s house is directly above Luke’s house.
6. Kevin lives between Adrine and the school.

Write the location of each person’s house.

7. Jack  A3  
8. Stacy  
9. Amanda  
10. Luke  
11. Adrine  
12. Kevin  

7 23  161
The graph shows the fruits Ms. Lopez’s students ate on Monday.

13 How many apples did the class eat? 
14 How many more berries than pears did the class eat? 
15 Which fruit was eaten most? 
16 Which fruit was eaten least? 
17 How many pieces of fruit did the class eat in all? 

18 Challenge Write two more questions that can be answered by looking at the graph.

162 one hundred sixty-two
The map shows the stops on a postal worker’s route.

Describe the location of each stop.

1. Stop 1 is at the intersection of Avenue A and Sixth Street.
2. Stop 2 is at the intersection of Avenue B and Sixth Street.
3. Stop 3 is at the intersection of Avenue C and Sixth Street.
4. Stop 4 is at the intersection of Avenue D and Sixth Street.
5. Stop 5 is at the intersection of Avenue E and Sixth Street.
6. Stop 6 is at the intersection of Avenue F and Sixth Street.
7. Stop 7 is at the intersection of Avenue G and Sixth Street.
Draw a point for each stop on Sarah’s paper delivery route. Label each point with the stop number.

Stop 1 is at the intersection of Avenue H and Fifth Street.

Stop 2 is at the intersection of Avenue F and Sixth Street.

Stop 3 is at the intersection of Avenue E and Fourth Street.

Stop 4 is at the intersection of Avenue A and Second Street.

**Challenge**

Tim earns $1 every 2 weeks for taking out the trash. How much money can he earn in 8 weeks? Fill in the graph to find out.

He can earn _________ in 8 weeks.
Graphing Solutions to Open Number Sentences

NCTM Standards 1, 2, 5, 6, 7, 8, 10

1. Complete the table and graph the points.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>△</td>
<td>7</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>⬤</td>
<td>4</td>
<td>7</td>
<td>3</td>
<td>0</td>
<td>9</td>
</tr>
</tbody>
</table>

2. If △ and ⬤ must both be whole numbers, could △ be 2? Explain your answer.

3. If △ and ⬤ must both be whole numbers, could ⬤ be 100? Explain your answer.

© Education Development Center, Inc.
4 Complete the table and graph the points.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5 If □ and ○ must both be whole numbers, could □ be 100? Explain your answer.

6 If □ and ○ must both be whole numbers, could ○ be 2? Explain your answer.

7 Challenge What do you notice about the points on the graph?

166 one hundred sixty-six CLXVI 2 83
Problem Solving Strategy

Make a Table

NCTM Standards 1, 2, 6, 7, 8, 9, 10

Pens and notepads are on sale!

Limit: no more than 3 of each item to a customer.

Solve each problem.

1. Han made a purchase at the school store. The amount she spent is a multiple of 7. What did Han buy?

2. The amount that Max spent was a two-digit number. When the two digits are added together they equal 4. What did Max buy?

3. Shana and Stu spent the same amount of money at the school store, but they bought different items. If Shana didn’t buy any notepads, what did Stu buy?
Problem Solving Test Prep

Choose the correct answer.

1. Martina had 2 pizzas at her party. She cut each into the same number of slices. After 4 slices were eaten, \( \frac{3}{4} \) of the slices were left. Into how many slices was each pizza cut?
   - A. 4
   - B. 8
   - C. 12
   - D. 16

2. James lives 6 blocks from school. He rides his bike to and from school on Monday, Wednesday, and Friday. How many blocks does he ride in one week?
   - A. 12
   - B. 18
   - C. 36
   - D. 48

Show What You Know

Solve each problem. Explain your answer.

3. A snack machine takes only nickels, dimes, and quarters. You want to buy a snack for 35¢. How many ways can you pay for it? Explain how you know that you have found all possible ways.

4. The table shows the prices of different numbers of postcards.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>14¢</td>
<td>28¢</td>
<td>42¢</td>
<td>84¢</td>
<td>98¢</td>
</tr>
</tbody>
</table>

Brad needs 5 postcards. How much will they cost? Explain two different ways to find the answer.
Review/Assessment

Students were asked to choose their favorite subject. Lessons 1 and 2

<table>
<thead>
<tr>
<th>FAVORITE SUBJECT</th>
<th>▲</th>
<th>▲</th>
<th>▲</th>
<th>▲</th>
<th>▲</th>
<th>▲</th>
<th>▲</th>
<th>▲</th>
<th>▲</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language Arts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key: Each ▲ = 10 students.

1. How many students chose Social Studies as their favorite subject? _________________

2. How many more students chose Math than chose Science? _________________

3. How many students answered the survey? _________________

A pair of gloves costs $2.00, and a hat costs $5.00. There is a limit of 3 of each item to a customer. Complete the table and solve the problems. Lessons 6 and 10

4. What items would you buy if you spent the greatest amount possible? ____________________________

5. What can you purchase for $17? ____________________________
Describe the location of each person. Lesson 8

6 Julia is at the intersection of Avenue _____ and _______ Street.

7 Mark is at the intersection of Avenue _____ and _______ Street.

8 Maddy is at the intersection of Avenue _____ and _______ Street.

Lola tosses a number cube numbered 1 through 6. Lessons 4 and 5

9 Is it possible or impossible for Lola to toss an odd number?

10 Is Lola more likely to toss a number less than 2 or a number greater than 3?

Lola made a bar graph of her results. Lesson 3

11 Which toss occurred most often?

12 How many times did Lola toss a number greater than 3?

170 one hundred seventy

2 5 17
Allyn bought 4 pairs of blue socks and 4 pairs of green socks. The rest of the socks he bought were white. He bought 20 socks (10 pairs of socks). How many white socks did he buy?

☐ white socks or ☐ pairs of white socks
For each diagram, complete the column in the table below.

<table>
<thead>
<tr>
<th>Number of blue squares</th>
<th>Number of orange squares</th>
<th>Number of white squares</th>
<th>Total number of squares</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Challenge**  
Circle the sentences that correctly describe the table above.  
**B** stands for the number of blue squares, **O** stands for the number of orange squares,  
**W** stands for white squares, and **T** is total squares.

\[
B \cdot O \cdot W \cdot T = B \cdot O \cdot T! \cdot W \cdot W! \cdot O \cdot T \cdot B \]

\[
T! \cdot B \cdot W \cdot O \cdot T \cdot O \cdot B \cdot W
\]

172  one hundred seventy-two  CLXXII  2  2  43
For each problem, complete the number sentences on the left. Circle the sentence that matches the story. Then write the fact family for that sentence on the right.

<table>
<thead>
<tr>
<th>Sentences</th>
<th>Story</th>
<th>Fact Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 ÷ 3</td>
<td>Three north-south avenues cross our town. Six east-west streets cross those avenues. How many intersections are there?</td>
<td>6 3</td>
</tr>
<tr>
<td>3 ÷ 6</td>
<td></td>
<td>3 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sentences</th>
<th>Story</th>
<th>Fact Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 ÷ 8</td>
<td>Four north-south avenues cross our town, and eight east-west streets cross our town. Those are our only roads. How many roads do we have?</td>
<td></td>
</tr>
<tr>
<td>8 ÷ 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 ÷ 8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sentences</th>
<th>Story</th>
<th>Fact Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 ÷ 5</td>
<td>When Midori wraps a birthday present, she always uses 5 pieces of tape. She used 45 pieces of tape to wrap birthday gifts this month. How many gifts did she wrap?</td>
<td></td>
</tr>
<tr>
<td>5 ÷ 45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 ÷ 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 ÷ 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Write a story to match each number sentence.

\[ \frac{7}{4} \]

\[ \frac{48}{8} \]

**Challenge** Write a multiplication and division fact family using the number **56**. Then write a story about one of the number sentences.

\[ \frac{56}{7} \]

\[ \frac{56}{8} \]
Write a number sentence to find the number of small squares hidden behind each figure.

1. \(4 \times 2 = 8\)
2. \(3 \times 5 = \square\)
3. \(\square \times \square = \square\)
4. \(\square \times \square = \square\)
5. \(\square \times \square = \square\)
6. \(\square \times \square = \square\)
7. \(\square \times \square = \square\)
Write the number of small squares hidden behind each shaded rectangle. Then complete a number sentence for the entire figure.

**Challenge** Draw a rectangle to match the number sentence.

5 3 15

176 one hundred seventy-six
Write the number of squares in each section. Then complete a multiplication sentence for all the squares in the array.

Example:

```
  6  4
 12  8

6  5  30
```

1

2

3  59  CLXXVII  one hundred seventy-seven 177
Eric planted 4 rows of cucumber plants last year, with 7 plants in each row. This year he added 2 more rows with 7 plants in each row. Write a number sentence to show how many plants he has now.

Write the number of squares in each section. Then complete a multiplication sentence for all the squares in the array.

Challenge
For each diagram, write the number of squares in each part. Then write a multiplication sentence for the entire array.

1

\[
\begin{array}{c}
\text{45} \\
\end{array}
\]

2

\[
\begin{array}{c}
\end{array}
\]

3

4

prime  CLXXIX  one hundred seventy-nine  179
Draw a line to cut each of the arrays into 2 smaller arrays. Use the smaller arrays to figure out the number of squares in the entire array.

Sol's store sold pens in packs of 5. Today, Sol sold 16 packs of pens. Ten of the packs contained black pens, and the rest had blue pens. How many pens of each type did Sol sell?

_____ black pens and _____ blue pens

Challenge Draw a picture to show how you can use the numbers you wrote in Problem 7 to help you solve 16 5.

180 one hundred eighty  CLXXX  2  2  3  3  5
Separating Arrays into Four Regions

Complete the Cross Number Puzzle and the multiplication sentence to match each separated array.

1.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>50</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>8</td>
<td></td>
<td>108</td>
</tr>
</tbody>
</table>

\[12 \times \boxed{\phantom{0}} = 108\]

2.

\[\boxed{\phantom{0}} \times \boxed{\phantom{0}} = \boxed{4}\]

3.

\[\boxed{\phantom{0}} \times \boxed{\phantom{0}} = \boxed{\phantom{0}}\]

prime    !!!    one hundred eighty-one 181
Draw and label an array to match each Cross Number Puzzle. Then complete the puzzle.

4

36 30

30 25

5

50 10

30

6

10 2

20

**Challenge** Callie drew an array with 12 rows and 7 tiles in each row. How can you find how many tiles are in the array?

---

182 one hundred eighty-two  CLXXXII  13
1. Two numbers have a product of 54. Their difference is 25. What are the numbers?

2. The bookstore has 48 books displayed on 3 shelves. Each shelf has 4 more books than the shelf above. How many books are on each shelf?

3. Eleven friends shared 143 trading cards equally. How many cards did each friend get?
Problem Solving Test Prep

Choose the correct answer.

1. Which numbers make a fact family shown by the array?
   A. 3, 7, 10  C. 3, 9, 27
   B. 3, 7, 21  D. 3, 8, 24

2. The numbers on the cube below are counting numbers, starting with 1. Rita tosses the cube one time. Which list shows all possible outcomes?
   A. 1, 3, 5  B. 1, 3, 5, 6  C. 1, 2, 3, 4, 5  D. 1, 2, 3, 4, 5, 6

3. Which pair of numbers would NOT make a true number sentence?
   \[ \square + \bigtriangleup = 23 \]
   A. 12, 13  C. 14, 9
   B. 11, 12  D. 15, 8

4. The clocks let you find how long it takes Lia to get to school. What fraction of an hour does it take her to get to school?

Leaves home | Arrives at school
---|---
9:00 | 10:00
9:01 | 10:01
9:02 | 10:02
9:03 | 10:03
9:04 | 10:04
9:05 | 10:05
9:06 | 10:06
9:07 | 10:07
9:08 | 10:08
9:09 | 10:09

A. \( \frac{1}{4} \)  B. \( \frac{1}{2} \)  C. \( \frac{2}{3} \)  D. \( \frac{3}{4} \)

Show What You Know

Solve the problem. Explain your answer.

5. Use the graph at right. How many students were absent on Monday? Explain.

<table>
<thead>
<tr>
<th>GRADE</th>
<th>ABSENT STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fifth grade</td>
<td>4</td>
</tr>
<tr>
<td>Fourth grade</td>
<td>5</td>
</tr>
<tr>
<td>Third grade</td>
<td>8</td>
</tr>
</tbody>
</table>

Key: Each \( \text{\ding{55}} \) = 3 students.
For each diagram, write the number of squares in each part. Then write a multiplication sentence for the entire array.

1. Lesson 5

```
40
```

Number of squares in A: 

Number of squares in B: 

Number of blue squares: 

Number of orange squares: 

Number of white squares: 

Total number of squares: 

2. Lesson 6

```
```

Number of squares in A: 

Number of squares in B: 

Number of squares in C: 

Number of squares in D: 

Total number of squares: 

3. Lesson 4

```
```

A

B

C

D

Number of squares in A: 

Number of squares in B: 

Number of squares in C: 

Number of squares in D: 

Total number of squares: 

4. Lesson 1

```
```

Number of squares: 

Total number of squares: 

---

5. CLXXXV one hundred eighty-five 185
Write a multiplication sentence to describe the array. Lesson 3

5

Write the fact family for the story. Lesson 2

7 Jared passed out 56 playing pieces equally to 7 players. How many pieces did each player get?

Stacy bakes a dozen muffins each month for snacks. How many months does it take her to bake 132 muffins?

There are 100 vehicles in the parking lot. Ten are motorcycles. The rest are cars and trucks. There are twice as many cars as trucks. How many cars are in the parking lot? Lesson 7

186 one hundred eighty-six
Measuring to the Nearest $\frac{1}{4}$ Inch

Measure each segment to the nearest quarter inch.

1. _________________________ in.

2. _________________________ in.

3. —— in.  4. —— in.

5. _________________________ in.  6. _________________________ in.

7. _________________________ in.

8. Find a book in your classroom. Measure its height to the nearest quarter inch.

     in.

9. Measure the length of one of your crayons to the nearest quarter inch.

     in.
10 Measure each segment to the nearest quarter inch.

11 Write the names of the segments in order from shortest to longest. Explain how you determined the order to write the segments.

12 Challenge Sums of lengths:

A: \text{in.} \quad B: \text{in.} \quad C: \text{in.} \quad F: \text{in.}

13 Challenge Differences between lengths:

A: \text{in.} \quad D: \text{in.} \quad F: \text{in.} \quad G: \text{in.}

188 one hundred eighty-eight \quad \text{CLXXXVIII} 2 2 47
1. Measure the worms’ standing heights to the nearest $\frac{1}{4}$ inch.

   Will __$_{\text{in.}}$__
   Wanda __$_{\text{in.}}$__
   Wendy __$_{\text{in.}}$__
   Walt __$_{\text{in.}}$__
   Willow __$_{\text{in.}}$__

2. Measure the worms’ seated heights to the nearest $\frac{1}{4}$ inch.

   Will __$_{\text{in.}}$__
   Wanda __$_{\text{in.}}$__
   Wendy __$_{\text{in.}}$__
   Walt __$_{\text{in.}}$__
   Willow __$_{\text{in.}}$__

   3  3  3  7  ! ! ! !

   one hundred eighty-nine 189
3 Convert the measurements from feet to inches.

| 24 inches | 2 feet |   | 2 feet |
| 3 feet | 4 | inches | 6 feet |
| 5 feet | 6 | inches | 8 |

4 Convert the measurements from just inches to feet and inches.

| 50 inches | 5 | feet | 10 |
| 54 inches | 6 | feet | 12 |

5 Explain how to convert a measurement from inches to feet and inches.

---

6 **Challenge** The distance around Min’s head is 20 inches. Her arm length is \(\frac{1}{2}\) foot more than that. Her height is twice as much as her arm length.

Min’s head

| 20 in. |   | ft | in. |

Min’s arm length

|   | in. |   | ft | in. |

Min’s height

|   | in. |   | ft | in. |
1. What is the height of the tallest student in Grade 1? \[\square\text{ in.}\]

2. What is the height of the largest number of students? Explain. \[\square\text{ in.}\]

3. If all the students line up from tallest to shortest, what is the height of the student in the middle? \[\square\text{ in.}\]

4. If we choose any one student at random from Grade 1, what would most likely be his or her height? \[\square\text{ in.}\]
Use the class bar graphs of standing and seated heights to fill in the blanks.

5 How many students have a seated height of about 30 inches? ___ students

6 How many students are taller than 55 inches standing up? ___ students

7 About half the class is less than ___ inches tall.

8 The seated height of the largest number of students is ___ inches.

9 How many students are more than 53 inches tall, but less than 58 inches tall? ___ students

10 If you choose one student at random from the class, what is most likely the seated height for that student? ___ inches

11 Challenge Make up your own question about the bar graphs and answer it.

192 one hundred ninety-two 2 2 2 2 2 6
**Measuring in Centimeters**

1. Measure each segment to the nearest centimeter.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
</table>

Draw a segment to match each length.

2. 8 cm

3. 4 cm

4. measures 3 cm when rounded to the nearest centimeter, but is longer than 3 cm

5. Explain how you decided on the length of the segment in Problem 4.
Measure each segment to the nearest centimeter.

A: [ ] cm  C: [ ] cm  E: [ ] cm  G: [ ] cm

B: [ ] cm  D: [ ] cm  F: [ ] cm  H: [ ] cm

Write the names of the segments in order from shortest to longest.

____  ____  ____  ____  ____  ____  ____  ____  ____

Challenge Which is longer: 3 inches or 7 centimeters? How much longer?

194 one hundred ninety-four  CXCIV  2  97
A on this page is area. Here is one unit of area:  

P on this page is perimeter. Here is a 1 cm unit of perimeter:  

Find the area and the perimeter for each figure.

A:  

P:  

A:  

P:  

A:  

P:  

A:  

P:  

A:  

P:  

3  5  13  CXCV  one hundred ninety-five 195
7 Use a ruler to measure the perimeter of each figure to the nearest centimeter.

<table>
<thead>
<tr>
<th>Figure</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perimeter</td>
<td>cm</td>
<td>cm</td>
<td>cm</td>
<td>cm</td>
<td>cm</td>
<td>cm</td>
</tr>
</tbody>
</table>

8 How did you find the perimeter of each figure?

9 **Challenge** Draw two figures with an area of 7 sq cm but different perimeters.

P: cm

P: cm

196 one hundred ninety-six
Find the area and perimeter for each rectangle.

1. A: [ ] sq cm  
   P: [ ] cm

2. A: [ ] sq cm  
   P: [ ] cm

3. A: [ ] sq cm  
   P: [ ] cm

4. A: [ ] sq cm  
   P: [ ] cm

5. A: [ ] sq cm  
   P: [ ] cm

6. A: [ ] sq cm  
   P: [ ] cm

prime | one hundred ninety-seven 197
Read and solve.

7 Max traced around his calculator and made a rectangle like this:

7 in.  
4 in.  
4 in.  
7 in.

The area of Max's figure is:  

\[ \text{sq in.} \]

The perimeter of Max's figure is:  

\[ \text{in.} \]

8 Suni’s gerbil cage is 12 inches long and 9 inches wide.

12 in.  
9 in.  
9 in.  
12 in.

How much area does her gerbil cage have?  

\[ \text{sq in.} \]

How far is one lap around the edge of the cage?  

\[ \text{in.} \]

9 Jan drew a square with a perimeter of 28 inches. What was the area of Jan's square?

\[ \text{sq in.} \]

10 Chris made a square with square tiles that each had an area of 1 sq in. The square was made with 64 tiles. What was the perimeter of the square? Explain.

\[ \text{in.} \]

11 Challenge A rectangular garden has an area of 20 square feet. It is surrounded by 24 feet of fence. What are the length and width of the garden?

198 one hundred ninety-eight
Dana built a box with centimeter cubes that measured 3 cm from left to right, 5 cm from front to back, and 3 cm from top to bottom. Build a model of Dana’s box.

1. How many cubes did Dana need to make her box? __________ cubes

2. What was the volume of Dana’s box? __________ cubic cm

3. Dana added more cubes to her box, so she had a new box that was 4 cm from top to bottom. The other measurements stayed the same. How many more cubes did she need? __________ cubes

Fill in the measurements and the volume for each box.

4. 
   - cm
   - cm
   - cm
   Volume: __________ cubic cm

5. 
   - cm
   - cm
   - cm
   Volume: __________ cubic cm

6. 
   - cm
   - cm
   - cm
   Volume: __________ cubic cm

7. 
   - cm
   - cm
   - cm
   Volume: __________ cubic cm
Build each model and find its volume.

Volume: ___ cubic cm  Volume: ___ cubic cm

Seth built a rectangular box with centimeter cubes. He started by building a square. Then he built five more identical levels. The volume of his box was 54 cubic cm. What were its measurements? Explain.

———

Challenge  This box was built with centimeter cubes. Amy wants to cover it with wrapping paper.

How many square centimeters of paper will Amy need to cover . . .

just the front face? ___ sq cm  just the top? ___ sq cm

just the right side? ___ sq cm  the entire box? ___ sq cm

200 two hundred  CC  2  2  5  5
Jaden used square tiles to build an L-shaped figure with an area of 8 sq cm and a perimeter of 14 cm. Draw a picture of a figure like Jaden’s.

Miya made buildings out of centimeter cubes using a pattern. Find the volume of each building.

1. Jaden used square tiles to build an L-shaped figure with an area of 8 sq cm and a perimeter of 14 cm. Draw a picture of a figure like Jaden’s.

2. Volume: [ ] cubic cm

3. Volume: [ ] cubic cm

4. Volume: [ ] cubic cm

5. Volume: [ ] cubic cm

Make the next building in the pattern using centimeter cubes and find its volume.

[ ] cubic cm

3 67 two hundred one 201
Problem Solving Test Prep

Choose the correct answer.

1. There are 58 students in the Math Club. There are 8 more girls in the club than there are boys. How many girls are in the Math Club?
   
   A. 25 girls  
   B. 28 girls  
   C. 33 girls  
   D. 50 girls

2. Megan has two pennies, one nickel, and two dimes in her pocket. She needs 35 cents to buy a snack. What other coins does she need to buy a snack?
   
   A. two pennies, one nickel  
   B. three pennies, one nickel  
   C. two pennies, one dime  
   D. three pennies, one dime

Show What You Know

Solve each problem. Explain your answer.

3. A rectangular patio has an area of 90 square feet. The length of the patio is 10 feet.

   What is the width of the patio? Explain how you know.

   _________________________________
   _________________________________
   _________________________________
   _________________________________
   _________________________________
   _________________________________

4. Randy is looking at a map with 24 intersections. He sees 6 vertical lines on the map.

   How many horizontal lines are on the map? Explain how you know.

   _________________________________
   _________________________________
   _________________________________
   _________________________________
   _________________________________
   _________________________________
Measure to the nearest $\frac{1}{4}$ inch. Lessons 1 and 2

1. ________________ inches

2. ________________ inches

Measure to the nearest centimeter. Lesson 4

3. ________________ centimeters

4. ________________ centimeters

Draw a segment for the given length.

5. $3\frac{1}{4}$ inches

6. 11 cm

Some students measured the lengths of their erasers and made this graph. Lesson 3

7. How many students have erasers that are longer than 2 inches?

   ____ students

8. What is the length of the longest eraser?

   ____ inches
Find the perimeter (P) and area (A) of each figure. Lessons 5 and 6

![Images of figure 9 and figure 10 with grid]

P: \(\underline{\text{cm}}\)  
A: \(\underline{\text{sq cm}}\)  

P: \(\underline{\text{cm}}\)  
A: \(\underline{\text{sq cm}}\)  

11 Nick drew a rectangle with a length of 4 cm and a width of 2 cm. What was its area? What was its perimeter? Lesson 8

---

These boxes were built with centimeter cubes. Fill in the measurements and the volume of each box. Lesson 7

![Images of box 12 and box 13 with cubes]

Volume: \(\underline{\text{cubic cm}}\)  

Volume: \(\underline{\text{cubic cm}}\)
Classifying Polygons by the Number of Right Angles

1. Circle the figures with four right angles.

2. How can you describe the figures you circled in Problem 1?

3. Draw one circle around the angles that are smaller than a right angle.

4. Draw two circles around the angles that are larger than a right angle.
Draw a figure for each given area or perimeter and write the number of right angles for the figure. Each side of a square in the grid is 1 centimeter (cm).

5. Area is 5 square cm. Inside the figure, there are ____ right angles.

6. Perimeter is 6 cm. Inside the figure, there are ____ right angles.

7. Area is 13 square cm. Inside the figure, there are ____ right angles.

8. Perimeter is 12 cm. Inside the figure, there are ____ right angles.

9. **Challenge** Draw a figure with an area of $5\frac{1}{2}$ square cm. Inside the figure, there are ____ right angles.
Classifying Polygons Using Pairs of Parallel Sides

NCTM Standards 3, 6, 7, 8, 9, 10

Complete the description of each figure by filling in the missing numbers.

1. 4 sides
   2 pair(s) of parallel sides
   4 right angle(s)

2. ___ sides
   ___ pair(s) of parallel sides
   ___ right angle(s)

3. ___ sides
   ___ pair(s) of parallel sides
   ___ right angle(s)

4. ___ sides
   ___ pair(s) of parallel sides
   ___ right angle(s)

5. ___ sides
   ___ pair(s) of parallel sides
   ___ right angle(s)

6. ___ sides
   ___ pair(s) of parallel sides
   ___ right angle(s)

7. ___ sides
   ___ pair(s) of parallel sides
   ___ right angle(s)

8. ___ sides
   ___ pair(s) of parallel sides
   ___ right angle(s)
Write the letter of each figure in the section of the table that describes its attributes.

<table>
<thead>
<tr>
<th>Fewer Than 2 Pairs of Parallel Sides</th>
<th>Exactly 2 Pairs of Parallel Sides</th>
<th>More Than 2 Pairs of Parallel Sides</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Right Angle</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>One or More Right Angles</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How are figures G and K alike? How are they different?

Challenge I have exactly 4 sides. They are all straight. I have exactly 2 pairs of parallel sides. I have at least 1 right angle. What shape am I?

Draw what I might look like.

208 two hundred eight
How should each white figure be moved so it fits on the blue figure? Use slide, flip, or turn.

1. [Diagram of white and blue figures]
   - turn

2. [Diagram of white and blue figures]
   - 

3. [Diagram of white and blue figures]
   - 

4. [Diagram of white and blue figures]
   - 

5. [Diagram of white and blue figures]
   - 

6. [Diagram of white and blue figures]
   - 

7. Choose one of the problems above. Describe how you decided if it was a slide, flip, or turn.
Draw and connect the points on each grid. Remember, the first number tells how far to move right, and the second number tells how far to move up.

8 Place point A at (2,4).
   Place point B at (8,2).
   Place point C at (4,1).
   Place point D at (1,2).
   Draw \( AB \) by connecting A and B.
   Draw \( BC \), \( CD \), and \( DA \).

9 Add 2 to both numbers in each pair above.
   \( A1 \) is at (4,6).
   \( B1 \) is at (__, __).
   \( C1 \) is at (__, __).
   \( D1 \) is at (__, __).
   Draw \( A1B1, B1C1, C1D1 \), and \( D1A1 \).

10 Are the two figures congruent?

11 Challenge Compare these two patterns. Describe how they are alike, and how they are different. You can use the words flip, turn, and slide in your answer.
For 1 to 5, use the lettered figures below.

1. Which figures have at least 1 line of symmetry? ________________
2. Which pairs of figures are congruent? ______ and ______ ______ and ______ ______ and ______
3. Which figures are quadrilaterals? ________________
4. Which figures have at least 1 right angle? ________________
5. Which figures have parallel lines? ________________

prime two hundred eleven 211
Draw a line to show where each figure could be folded so that both parts match exactly. If the figure does not have a line of symmetry, leave it blank.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td><img src="6.png" alt="Image" /></td>
<td><img src="7.png" alt="Image" /></td>
<td><img src="8.png" alt="Image" /></td>
<td><img src="9.png" alt="Image" /></td>
<td><img src="10.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Only part of each figure is drawn. Complete each figure so that the gray line is a line of symmetry. Label each completed figure *triangle*, *quadrilateral*, or *pentagon*.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td><img src="11.png" alt="Image" /></td>
<td><img src="12.png" alt="Image" /></td>
<td><img src="13.png" alt="Image" /></td>
<td><img src="14.png" alt="Image" /></td>
<td><img src="15.png" alt="Image" /></td>
</tr>
</tbody>
</table>

**Challenge** What figures can you make by placing a mirror in different positions on the capital letter M? Draw two or three you discovered.

2212 two hundred twelve
Identifying Attributes of Two-Dimensional Figures

List all the figures that match the description.

A B C D E
F G H I J K

1. I have 3 sides.

2. I'm a quadrilateral.

3. I'm a pentagon.

4. I have at least 1 line of symmetry.

5. I have 4 right angles.

6. I have at least 1 pair of parallel sides.

7. I have 3 angles that are smaller than a right angle.

8. I have at least 1 angle that is larger than a right angle.
3. Mandy cut the trapezoid and rearranged the two parts.

What is the area of the trapezoid? _____ square units

4. Simon cut this parallelogram into two parts and rearranged the parts to form a rectangle.

Draw a picture to show what he might have done.

What is the area of the parallelogram? _____ square units

5. **Challenge** Explain how you found the area of the parallelogram.

---

214  two hundred fourteen  !  2   107
Identifying and Defining Polygons

1. Circle the polygons. Cross out the figures that are NOT polygons.

Diamonds, Square, Rectangles, Triangles, Parallelograms, Rhombi, Trapezoids, Circles.
Connect some of the points to make the specified figures.

2 Choose at least 4 of the points and connect them to make a polygon.

3 Connect the same points you chose for Problem 2 in a way that does NOT make a polygon.

4 Choose at least 4 of the points and connect them to make a polygon with at least 1 pair of parallel sides.

5 Choose points and connect them to make a triangle with a right angle.

6 Choose at least 4 points and connect them to make a polygon with exactly 2 right angles.

7 Challenge Choose points and connect them to make a pentagon with exactly 1 right angle.
Label the groups of figures as *pyramids*, *prisms*, or *cones*.

1. These figures are all ____________.

2. These figures are all ____________.

3. These figures are all ____________.

4. Are all of the faces of a pyramid polygons? ____

   Are all of the faces of a prism polygons? ____

5. How is a cone different from a prism and a pyramid?
Answer the questions about the three-dimensional figures you can make by folding these nets.

6 How many faces will be triangles? _____
How many faces will be squares? _____
The three-dimensional figure will be a: (circle one)
Pyramid  Prism

7 How many faces will be triangles? _____
How many faces will be rectangles? _____
The three-dimensional figure will be a:
Pyramid  Prism

8 Challenge
How many faces will be squares? _____
The three-dimensional figure will be a:
Pyramid  Prism
Write the name of the three-dimensional figure that matches each clue. Use the names below. Some names will not be used.

<table>
<thead>
<tr>
<th>Clue</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I have more than 1 pair of parallel faces.</td>
</tr>
<tr>
<td>2</td>
<td>More than 2 of my faces are triangles.</td>
</tr>
<tr>
<td>3</td>
<td>I have exactly 2 flat surfaces.</td>
</tr>
<tr>
<td>4</td>
<td>I have 9 edges.</td>
</tr>
</tbody>
</table>

rectangular prisms
triangular prisms
pyramids
cylinders
cones
spheres
Use the figures from the class Figure Zoo. Write the letters of the figures that match each set of clues.

<table>
<thead>
<tr>
<th>Clues</th>
<th>Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔ One face is flat on the table. My top is also level. Those 2 top and bottom faces are not the same size.</td>
<td></td>
</tr>
<tr>
<td>✔ Some of my faces have exactly 1 pair of parallel sides. All my other faces are rectangles.</td>
<td></td>
</tr>
<tr>
<td>✔ All my faces are parallelograms. Some, but not all, of my faces are squares.</td>
<td></td>
</tr>
<tr>
<td>✔ At least 2 of my faces are quadrilaterals. At least 2 of my faces are triangles.</td>
<td></td>
</tr>
<tr>
<td>✔ I have fewer than 12 edges.</td>
<td></td>
</tr>
</tbody>
</table>

**Challenge** Use the diagram to complete the sentences.

I have _____ triangular faces.
I have _____ rectangular face.
I am a ________________.
Describing Three-Dimensional Figures

Tape or glue a small copy of a net for a three-dimensional figure here. You can use the net to help answer the questions about the three-dimensional figure.

1. How many faces does the three-dimensional figure have? _______

2. Describe the shapes of the faces.

3. How many of the faces have at least 1 line of symmetry? _______

4. How many of the faces have at least 2 lines of symmetry? _______

5. On the copy of the net above, shade two congruent faces. If no faces are congruent, write none on the line. _______
Write the number for each figure in the blank.

6 How many parallel faces does the prism have? ____

Face A has ____ sides.

There are ____ vertices on this prism.

____ the number of sides
on the top face

____ the number of vertices
on the prism

7 How many vertices are on the top of the pyramid? ____

Face B has ____ sides.

There are ____ vertices on this pyramid.

____ the number of sides
on the bottom face

____ the number of vertices
on the pyramid

**Challenge** Describe a difference between a prism and a pyramid.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Problem Solving Strategy
Look for a Pattern

1. These figures belong:
   ![figures]

   These figures do NOT belong:
   ![figures]

   Which figures belong?
   ![figures]

2. Seven friends are playing a game. Each person gets one of the figures shown below. The person that gets the figure that does not belong will be knocked out of the game. Which figure does NOT belong? Explain your answer.
   ![figures]

3. Richard used a pattern to draw lines inside each large triangle.
   ![figures]

   What is Richard’s pattern?

prime two hundred twenty-three 223
Problem Solving Test Prep
Choose the correct answer.

1. Jerome shaded some squares on a piece of grid paper.

What is the area of the shaded part of the paper?
A. 8 square units
B. 10 square units
C. 15 square units
D. 16 square units

2. Mr. Smith’s third-grade classroom has 4 rows of desks. There are 7 desks in each row. How many desks are in Mr. Smith’s classroom?
A. 11 desks
B. 14 desks
C. 21 desks
D. 28 desks

3. The pictograph shows what is for sale at the bakery.

<table>
<thead>
<tr>
<th>BAKERY ITEMS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cookies</td>
<td>●●●●●●</td>
</tr>
<tr>
<td>Blueberry muffins</td>
<td>●●●●</td>
</tr>
<tr>
<td>Lemon muffins</td>
<td>●●●●●</td>
</tr>
</tbody>
</table>

Key: Each ● = 2 items.

How many muffins are for sale?
A. 9 muffins
B. 16 muffins
C. 18 muffins
D. 36 muffins

4. Lena is twice as old as Jasmine. Trisha is 5 years older than Jasmine. Trisha is 12. How old is Lena?
A. 14 years old
B. 12 years old
C. 9 years old
D. 7 years old

Show What You Know

Solve the problem. Explain your answer.

5. Edward made this pattern with square tiles.

Draw the next figure in Edward’s pattern.

Explain how you know your answer is correct.

Edward made this pattern with square tiles.

Draw the next figure in Edward’s pattern.

Explain how you know your answer is correct.
1. Draw a line to connect congruent figures. Circle the polygons. Lessons 3 and 6

2. Complete the description of the figure by filling in the missing numbers. Lessons 1, 2, 4 and 5

   ____ sides
   ____ pair(s) of parallel sides
   ____ right angles
   ____ line(s) of symmetry

3. Complete the description of the figure by filling in the missing numbers. Lessons 1, 2, 4 and 5

   ____ sides
   ____ pair(s) of parallel sides
   ____ right angles
   ____ line(s) of symmetry

   3 3 5 5   two hundred twenty-five 225
Complete the description of the figure by filling in the blanks. Lessons 7, 8 and 9

<table>
<thead>
<tr>
<th>Net</th>
<th>Three-Dimensional Figure</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4   | ![Net Image](image1)     | ![Prism Image](image2) | ____ faces  
    |                            | ____ edges  
    |                            | ____ vertices  
    |                            | This figure is a _________. |
| 5   | ![Net Image](image3)     | ![Pyramid Image](image4) | ____ faces  
    |                            | ____ edges  
    |                            | ____ vertices  
    |                            | This figure is a _________. |

Read the clues. Then write *prism*, *pyramid*, or *cone*. Lesson 8

<table>
<thead>
<tr>
<th>Clues</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>6  My two parallel faces are triangles. All my other faces are rectangles.</td>
<td></td>
</tr>
<tr>
<td>7  I have 4 faces. My faces are all triangles.</td>
<td></td>
</tr>
<tr>
<td>8  Lon wants all the figures in his collection to have at least 1 pair of parallel sides. Cross out the figure that does not belong in Lon’s collection. Draw another figure that could be in Lon’s collection. Lesson 10</td>
<td></td>
</tr>
</tbody>
</table>

226 two hundred twenty-six
What is the value of the coins?

<table>
<thead>
<tr>
<th>1</th>
<th>dimes</th>
<th>20¢</th>
<th>2</th>
<th>the dimes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pennies</td>
<td>3¢</td>
<td>5</td>
<td>the pennies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>total</td>
<td></td>
<td></td>
<td>all the coins</td>
<td>$1.15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>10 the dimes</th>
<th></th>
<th>4</th>
<th>15 the dimes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 the pennies</td>
<td></td>
<td>15</td>
<td>the pennies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 all the coins</td>
<td></td>
<td>15</td>
<td>all the coins</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 23</td>
<td></td>
<td>15</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

Write the outputs. Then record the calculations in a number sentence.

5

5 7

addition

\[ \times 5 \]

6

5 7

\[ \times 5 \]

addition

227
Find the amounts and use them to complete the multiplication sentences.

<table>
<thead>
<tr>
<th>G</th>
<th>G</th>
<th>G</th>
<th>G</th>
<th>G</th>
<th>G</th>
<th>G</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**1 row of Gs:**

<table>
<thead>
<tr>
<th>7</th>
<th>1 row of Gs</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 row of Bs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 row of each letter:</td>
<td></td>
<td>1 14</td>
</tr>
</tbody>
</table>

**6 rows of Gs:**

<table>
<thead>
<tr>
<th>8</th>
<th>6 rows of Gs</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 rows of Bs:</td>
<td></td>
</tr>
<tr>
<td>6 rows of each letter:</td>
<td>6 14</td>
</tr>
</tbody>
</table>

**10 rows of Gs:**

<table>
<thead>
<tr>
<th>9</th>
<th>10 rows of Gs</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 rows of Bs:</td>
<td></td>
</tr>
<tr>
<td>10 rows of each letter:</td>
<td>10 14</td>
</tr>
</tbody>
</table>

**16 rows of Gs:**

<table>
<thead>
<tr>
<th>10</th>
<th>16 rows of Gs</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 rows of Bs:</td>
<td></td>
</tr>
<tr>
<td>16 rows of each letter:</td>
<td>16 14</td>
</tr>
</tbody>
</table>

**Challenge**

<table>
<thead>
<tr>
<th>13</th>
<th>2 of each item</th>
<th>36¢</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 of each item:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 of each item:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 of each item:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 of each item:</td>
<td>26 18</td>
<td></td>
</tr>
</tbody>
</table>

**pencils 8¢ each**

<table>
<thead>
<tr>
<th>14</th>
<th>6 pads</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 pads</td>
<td></td>
</tr>
<tr>
<td>26 pads</td>
<td></td>
</tr>
</tbody>
</table>

**pads of paper 10¢ each**

<table>
<thead>
<tr>
<th>14</th>
<th>6 pads</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 pads</td>
<td></td>
</tr>
<tr>
<td>26 pads</td>
<td></td>
</tr>
</tbody>
</table>

**228 two hundred twenty-eight CCXXVIII**
Complete the multiplication problems to match the diagram. Make the third product equal to the sum of the first two products.

1. \[ \begin{array}{c}
    \begin{array}{c}
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For Conall’s birthday party, his parents hid packs of 10 trading cards for the children to find. Each of the 8 children found 2 packs, and then each got another 4 cards for game prizes. How many cards did the children collect? Explain how you found your answer.

**Challenge 10**

\[(\square \times 8) + (\square \times 8)\]

\[\square \square \square \square \square \square \]

**Challenge 11**

\[(\square \times 4) + (\square \times 4)\]

\[\square \square \square \square \square \square \]
Multiplying with Base-Ten Blocks

Write the number represented by . . .

1. the rods only
   20
2. the units only
   3
3. all the blocks
   23

4. 6 the rods
   ______
5. 6 the units
   ______
6. 6 all the blocks
   ______

7. 9 the rods
   ______
8. 9 the units
   ______
9. 9 all the blocks
   ______

10. 15 the rods
    ______
11. 15 the units
    ______
12. 15 all the blocks
    ______

13. 23
    \times 15
    ______

Write the number represented by . . .

1. the rods only
   ______
2. the units only
   ______
3. all the blocks
   ______

4. 4 the rods
   ______
5. 4 the units
   ______
6. 4 all the blocks
   ______

7. 8 the rods
   ______
8. 8 the units
   ______
9. 8 all the blocks
   ______

10. 36
    \times 16
    ______

CCXXXI  two hundred thirty-one 231

NCTM Standards 1, 2, 6, 7, 9, 10
Find each product.

How much money?

3 times the amount
2 times the amount
5 times the amount
6 times the amount
4 times the amount
10 times the amount
14 times the amount

How many objects?

A row of 10 cones and 4 pyramids

Twice as many objects
Five times as many objects
Ten times as many objects

How many letters?

A row of 5 A's and 9 B's

The total number of letters is

Three times as many letters
Five times as many letters
Half as many letters
Ten times as many letters

Challenge Complete the tables.

<table>
<thead>
<tr>
<th>m</th>
<th>5</th>
<th>10</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 m</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 m</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

232 two hundred thirty-two CCXXXII
Complete the multiplication sentences to match the arrays. Make the third product equal to the sum of the first two products.

1. \[7 \times 4 \quad \boxed{} \quad \boxed{} \quad 13 \times 4 \quad \boxed{} \quad \boxed{} \]

2. \[7 \times 6 \quad \boxed{} \quad \boxed{} \quad 6 \times 6 \quad \boxed{} \quad \boxed{} \]

3. \[6 \times 6 \quad \boxed{} \quad \boxed{} \times 6 \quad \boxed{} \quad \boxed{} \]

4. \[7 \times 7 \quad \boxed{} \quad \boxed{} \times 7 \quad \boxed{} \quad \boxed{} \]

5. \[10 \quad 4 \quad \boxed{} \quad \boxed{} \]

NCTM Standards 1, 2, 6, 7, 8, 9, 10

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Name ___________________________ Date/Time ________

Chapter 12
Lesson 4

Multiplying with Arrays

CCXXXIII \text{ two hundred thirty-three } 233
Draw a line to split the array into two parts. Complete the multiplication sentences to match your array.

Challenge Hank delivers a newspaper to 29 customers each day. How many newspapers does Hank deliver in one week? Explain how you can find the answer by solving simpler problems.

234 two hundred thirty-four CCXXXIV
Separating Arrays to Multiply

Use the lines and intersections to help complete the multiplication sentences.

1. \[14 \times 6\]

2. \[13 \times 7\]

Complete the multiplication sentences by imagining the lines and intersections.

3. \[18 \times 3\]

4. \[23 \times 4\]

CCXXXV  two hundred thirty-five 235
Some of the steps used above are left out. Use your own paper if you want to write the missing steps.

Challenge Ms. Liu’s class is making 8 signs to display around town. Each sign will say, “CLOTHING DRIVE AT HILL ELEMENTARY.” The students decided to cut each letter out of bright paper to make the signs easy to read. How many letters do they need to cut out to make all the signs?

______________________________

Challenge Mr. Sandy received a shipment of 7 boxes of balls for next year’s table tennis tournament. In each box, there were 12 packages with 6 balls in each package. How many balls arrived in the shipment?

______________________________

236 two hundred thirty-six   CCXXXVI
Multiplying with Larger Numbers

NCTM Standards 1, 2, 6, 7, 8, 9, 10

Complete the multiplication sentences to go with the diagram. You may fill in the diagram if you wish.

1. 14 × 16

   10
   6

   10
   4

   14  16

2. 17 × 22

   20
   10
   7

   17  22

CCXXXVII  two hundred thirty-seven 237
Ms. Shaw’s class is collecting data on what students eat for breakfast. Every weekday before the class meeting, each student gets a 3-by-5 index card and writes what he or she ate for breakfast that morning. If all 27 of Ms. Shaw’s students do this for 3 weeks, how many index cards will be collected? Explain your answer.

---

**Challenge**

Find the missing factor.

```
15  105
```

---

238 two hundred thirty-eight CCXXXVIII
Complete the multiplication sentences. Imagine the lines and intersections or use the rectangle below.

1. \[14 \times 6 = 84\]

2. \[5 \times 85 = 17\]

3. \[7 \times 7 = 49\]

4. \[3 \times 39 = 117\]

NCTM Standards 1, 2, 6, 7, 8, 9, 10
Each student in Ms. Deleo’s class will need 6 straws for a math exploration. Ms. Deleo has 21 students and 84 straws. Are there enough straws for the exploration? Explain.

**Challenge**

<table>
<thead>
<tr>
<th>Number</th>
<th>Straws Needed</th>
<th>Straws Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>7</td>
<td>91</td>
</tr>
<tr>
<td>6</td>
<td>5 125</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>22 88</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>9 126</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>6 162</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>9 297</td>
<td></td>
</tr>
</tbody>
</table>

**240** Two hundred forty   **CCXL**
Solve the division problem. Use the rectangles if you wish.

1. $155 \div 5$
   - $30$
   - $5$

2. $45 \div 3$

3. $196 \div 7$

4. $132 \div 4$

5. $184 \div 8$

6. $288 \div 8$
The theater has 144 seats. There are 9 rows of seats. How many seats are in each row?

Draw a picture to show your work.

Write a number sentence to describe this problem.

___ seats in each row

**Challenge** There are 16 ounces in 1 pound.

___ pounds  48 ounces  ___ pounds  80 ounces

___ pounds  128 ounces  ___ pounds  160 ounces

___ pounds  176 ounces  ___ pounds  240 ounces
Problem Solving Strategy

Work Backward

NCTM Standards 1, 2, 6, 7, 8, 9

1. Aaron has 144 crayons that he arranges into 8 rows in his crayon box. How many crayons are in each row?

   \[
   \begin{array}{c|c|c|c|c|c|c|c|c}
   & & & & & & & & \\
   & & & & & & & & \\
   & & & & & & & & \\
   & & & & & & & & \\
   & & & & & & & & \\
   \hline
   8 & & 144 & & & & & & \\
   \hline
   \end{array}
   \]

   _____ crayons

2. Tom has 3 times as many apples as Susan. Susan has half as many apples as Lauren. Lauren has 14 more apples than Joey. Joey has 6 apples. How many apples does Tom have?

   _____ apples

3. Mr. Brown went shopping. He spent $17 on groceries. He used a $20 bill to buy a shirt and received $3.75 in change. He has $15 in his wallet now. How much money did Mr. Brown have in his wallet before he went shopping?

   $_____
Problem Solving Test Prep

Choose the correct answer.

1. What number completes the multiplication sentence for the array?

\[
\begin{array}{c}
\begin{array}{c}
\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\ss
What is the value of the coins?

1. dimes ______¢
2. the dimes ______¢
3. the dimes ______¢
4. the dimes ______¢

pennies ______¢
5. the pennies ______¢
6. the pennies ______¢
7. the pennies ______¢

total ______¢
8. all the coins ______¢
9. all the coins ______¢
10. all the coins ______¢

Complete the multiplication sentences.

5. $2.50  
10 • 7
4 • 7

6. 37  
30 • 7

CCXLV two hundred forty-five 245
Kyle earns money doing yard work. He deposits two thirds of what he earns in a savings account and keeps the rest to spend. Last month he kept $36. How much did Kyle earn?  

Alma found a rope in her garage. She cut off 3 pieces that were each 20 centimeters long. Then she cut the remaining rope into 2 equal pieces that were each 15 centimeters long. How long was the rope Alma found in her garage?
Measuring Temperature

What is the temperature?

1. Freezing
   - 42 °F

2. Freezing
   - °F

3. Freezing
   - °F

4. Monday
   - °F

5. Tuesday
   - °F
   - How much warmer?

4. Monday
   - °F
   - How much colder?

5. Thursday
   - °F

6. Friday
   - °F
   - How much colder?
A very cold day in Minnesota . . .

1. The temperature on the thermometer is ____ F.

2. The difference between the temperature on the thermometer and 15 F is ____ F.

3. 10 F colder than this thermometer is ____ F.

4. 20 F hotter than this thermometer is ____ F.

5. 8 F above freezing is ____ F.

6. 40 F above freezing is ____ F.

7. 32 F below freezing is ____ F.

The thermometer above shows the temperature at 6:00 A.M. The temperature is rising 4 F every hour.

8. **Challenge** What will the temperature be in 6 hours?

9. **Challenge** What will the time be when the temperature is 10 F?

   Draw the hands on the clock.
   Write the time.

248 two hundred forty-eight CCXLVIII 2 2 2 31
Write the time shown on each clock.

1. 15 minutes later
   - Clock 1:
     - Time: 3:30
   - Clock 2:
     - Time: : 
   - Clock 3:
     - Time: : 

2. 1 hour earlier
   - Clock 1:
     - Time: : 
   - Clock 2:
     - Time: : 
   - Clock 3:
     - Time: :

3. 30 minutes earlier
   - Clock 1:
     - Time: :
   - Clock 2:
     - Time: :
   - Clock 3:
     - Time: :

4. 45 minutes later
   - Clock 1:
     - Time: :
   - Clock 2:
     - Time: :
   - Clock 3:
     - Time: :
Draw the hands for each clock.

**5**

- 30 minutes later: 11:15
- 45 minutes later: 11:45
- 45 minutes later: 12:30

**6**

- 45 minutes earlier: 8:15
- 45 minutes earlier: 7:30
- 45 minutes earlier: 6:45

**7**

- 15 minutes later: 6:20
- 30 minutes later: 6:35
- 30 minutes later: 7:05

**Challenge** Write the missing number. Draw the clock hands. Write the times.

- 45 minutes later

250 two hundred fifty  CCL  2  5  5  5
Comparing Times

Write the missing time and draw the clock hands.

1. 3 hours 15 minutes earlier
   - :  
   - :

2. 2 hours 30 minutes later
   - 10:45  
   - :

For the pair of clocks, write the missing numbers and words above the arrow.

3. ___ hours 0 minutes later
   - 8:00  
   - 11:00

4. ___ hours ___ minutes
   - 9:25  
   - 9:10
Fill in the missing times, clock hands, words, and numbers.

At 12:30 Mark said, “I’ve been cleaning my room for 1 hour and 45 minutes.” What time did Mark start cleaning?

Challenge Fill in the missing word, numbers, clock hands, and times.

252 two hundred fifty-two CCLII 2 2 3 3 7
Draw a line to match each object to its weight.

1. 1 watermelon 1 ounce
2. 1 fully loaded truck 8 ounces
3. 1 apple 16 ounces
4. 1 pound of fruit salad 10 pounds
5. Morty, the produce clerk 165 pounds
6. Morty’s car 1 ton
7. 5 grapes 40 tons
Convert pounds to ounces. Remember that 1 pound (1 lb) equals 16 ounces (16 oz).

<table>
<thead>
<tr>
<th></th>
<th>2 lb</th>
<th>4 lb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>_____ oz</td>
<td>_____ oz</td>
</tr>
<tr>
<td>10</td>
<td>3 lb</td>
<td>5 lb</td>
</tr>
<tr>
<td></td>
<td>_____ oz</td>
<td>_____ oz</td>
</tr>
</tbody>
</table>

12. Complete the table.

<table>
<thead>
<tr>
<th>Ounces</th>
<th>Pounds and Ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 oz</td>
<td>_____ lb, _____ oz</td>
</tr>
<tr>
<td>55 oz</td>
<td>_____ lb, _____ oz</td>
</tr>
<tr>
<td>_____ oz</td>
<td>4 lb, 6 oz</td>
</tr>
<tr>
<td>_____ oz</td>
<td>6 lb, 4 oz</td>
</tr>
<tr>
<td>116 oz</td>
<td>_____ lb, _____ oz</td>
</tr>
<tr>
<td>_____ oz</td>
<td>13 lb, 8 oz</td>
</tr>
</tbody>
</table>

13. **Challenge** Label the bags in order from lightest to heaviest.

A
B
B
C
A
C
Fill in the blanks.

1. Dana used a scale and found out that the dictionary in her classroom weighed 4 lb, 5 oz or ____ oz.

2. How much would 2 dictionaries weigh?
   ____ lb, ____ oz or ____ oz

3. How much would 10 dictionaries weigh?
   ____ lb, ____ oz or ____ oz

4. If a shelf can’t hold more than 20 pounds, what is the largest number of dictionaries you could put on the shelf?
   ____ dictionaries weighing ____ lb, ____ oz, or ____ oz

5. About how many dictionaries are there in a ton of dictionaries? Explain how you found your estimate.

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________
Find the weight. All bags with the same label have the same weight.


256 two hundred fifty-six  CCLVI 2 2 2 2 2 2 2
Complete the table.

<table>
<thead>
<tr>
<th>Container</th>
<th>Cups</th>
<th>Fluid Ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup</td>
<td>1 cup</td>
<td>8 fl oz</td>
</tr>
<tr>
<td>half pint</td>
<td>1 cup</td>
<td></td>
</tr>
<tr>
<td>pint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2 half pints is 1 pint)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>quart</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2 pints is 1 quart)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>half gallon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2 quarts is 1 half gallon)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gallon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2 half gallons is 1 gallon)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Keesha had a gallon jug of apple cider. She poured out four 12 fl oz glasses of apple cider and wanted to put the rest of the apple cider in a half-gallon pitcher.

How much apple cider is left in the jug? ________________________________

Will it all fit in the half-gallon pitcher? Explain.
Solve. Explain your answer.

4 Seven people might each want a 6-ounce glass of juice. Shawn wants to make sure he has enough. How many quart containers of juice should he buy?

5 Cara read that it is a good idea to drink about 8 cups of water each day. If she drinks all of her water from pint bottles, how many bottles will she drink in a week?

6 Darius uses 2 cups of milk to make 6 servings of his famous cheese sauce. If he has to make enough cheese sauce to serve 100 people, how many gallons of milk does he need?

7 Clarice Cow can produce 9 gallons of milk in a day. If the farmer puts half of Clarice’s milk into half-pint containers and the rest into quart containers, how many of each type of container are filled each day?

8 Challenge Liu is using an 8-ounce container to fill a bird bath that holds 1 gallon of water. It takes her 30 seconds to fill the container and walk from the faucet to the bird bath and back. If she begins at 8:00 A.M., when will the bird bath be full?
Use the information to estimate your answer.

1. A fluid ounce of water weighs a little more than an ounce. About how much does a cup of water weigh?

When you have a lot of water, that little bit of extra weight for each fluid ounce can really add up. In a gallon of water, that extra adds up to about 5 ounces in weight. About how much does a gallon of water weigh?

Two ounces of popped popcorn fill a 7-cup bowl. If you want 28 cups of popcorn for a party, how many ounces do you need?

About how many cups of popcorn weigh 1 pound?
A cup of a mystery liquid weighs a little more than 6 oz. A 5-gallon can weighs about 7 lb when it is empty.

5 How much does the can weigh when it is full of the mystery liquid?

5 gallons _____ cups

_____ cups of the liquid weigh a bit more than _____ oz.

_____ oz _____ lb (_____ oz 10 lb)

_____ lb 7 lb _____ lb

6 If the can weighs 22 lb, how much liquid is in it?

________________________
________________________
________________________
________________________

7 Challenge Lead is a material that can be melted and poured into molds to form weights like fishing sinkers. Lead is so dense that a cup of melted lead would weigh almost 6 lb. About how much does 1 fluid ounce of melted lead weigh?

________________________
________________________
________________________
________________________
Analyzing Temperature Data

The thermometers show the temperatures at 7 P.M. in Nome, Alaska for 5 nights in December. Fill in the temperatures.

<table>
<thead>
<tr>
<th>Day</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
</tr>
<tr>
<td>Wednesday</td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
</tr>
</tbody>
</table>

6. Which day had the **warmest** temperature at 7 P.M.? ________________

7. Which day had the **coldest** temperature at 7 P.M.? ________________

8. Over the five-day period, was the temperature increasing, steady, decreasing, or variable? ________________

9. How many degrees did the temperature decrease from Monday to Tuesday? ________________

10. How many degrees did the temperature increase from Wednesday to Thursday? ________________
11 Shade the thermometers. Fill in any missing numbers.

2°F 8°F cooler  ____°F warmer 4°F

12 The coldest temperature ever recorded in Alaska was 80 F. The hottest temperature for Alaska was 180 F more, or _____ F.

13 The hottest temperature ever recorded in California was 134 F. The coldest temperature for California was 179 F less, or _____ F.

14 Challenge Jake knows that water freezes at 32°F, but he can never remember the temperature at which water boils. One day, he figured out that if he multiplied the freezing temperature by 6 and added 20, he would get the boiling temperature. Use Jake’s trick to find the boiling point of water.

262 two hundred sixty-two  CCLXII  2  131
Problem Solving Strategy

Act It Out

NCTM Standards 1, 4, 6, 7, 8, 9, 10

It takes Lexie 45 minutes to make one bracelet.

1. If she starts working at 10:30, and does not stop to take a break, what time will it be when Lexie finishes her third bracelet?

2. If she works non-stop for a total of 4 ½ hours, how many bracelets could Lexie make? Explain.

3. There are 42 gallons in a barrel of oil. About how many barrels does it take to make 1,000 gallons? Explain.

4. Nikki feeds her small dog 4 ounces of food each day. If this rate continues, how many days would it take her dog to eat 2 pounds of food? Explain.
Choose the correct answer.

1. What will the temperature be if it rises 8 degrees from what is shown on the thermometer?

   A. 33°F  
   B. 34°F  
   C. 36°F  
   D. 38°F

2. What part is NOT shaded?

   A. $\frac{5}{12}$  
   B. $\frac{7}{12}$  
   C. $\frac{5}{7}$  
   D. $\frac{7}{5}$

3. How would you move the white triangle to cover the shaded triangle?

   A. flip  
   B. turn  
   C. slide  
   D. flip and slide

4. Which rule describes this set of input-output cards?

<table>
<thead>
<tr>
<th>INPUT</th>
<th>4, 8</th>
<th>3, 7</th>
<th>1, 4</th>
<th>2, 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPUT</td>
<td>11</td>
<td>9</td>
<td>4</td>
<td>11</td>
</tr>
</tbody>
</table>

   A. Add the input numbers.  
   B. Add the input numbers, and then subtract 1.  
   C. Multiply the input numbers.  
   D. Add the input numbers, and then add 1 more.

Show What You Know

Solve the problem. Explain your answer.

Sara is meeting her friend at 2:15 P.M. The bus ride takes 45 minutes. Sara likes to leave for the bus stop 20 minutes before she catches the bus. At what time should she leave for the bus stop?
Shade the thermometer or write the temperature.  Lesson 1

1. Monday

2. Tuesday

3. Wednesday

Use the thermometers above to answer the questions.  Lesson 8

4. Which day was the warmest?

5. Which day was the coldest?

6. How many degrees did the temperature decrease from Tuesday to Wednesday?

For each pair of clocks, fill in the missing times and hands.  Lessons 2 and 3

7. 2 hours 30 minutes earlier

8. 1 hour 45 minutes later
9 Complete the table. Lessons 4 and 5

<table>
<thead>
<tr>
<th>Bird</th>
<th>Ounces</th>
<th>Pounds and Ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quail</td>
<td>4 oz</td>
<td>_____ lb, _____ oz</td>
</tr>
<tr>
<td>Chicken</td>
<td>_____ oz</td>
<td>1 lb, 5 oz</td>
</tr>
<tr>
<td>Turkey</td>
<td>29 oz</td>
<td>_____ lb, _____ oz</td>
</tr>
<tr>
<td>Goose</td>
<td>_____ oz</td>
<td>3 lb, 12 oz</td>
</tr>
</tbody>
</table>

Shana had 50 fl oz of lemonade. Lessons 6 and 7

10 She could fill _____ one-cup measure(s) and have _____ fl oz left over.

11 She could fill _____ pint glass(es) and have _____ fl oz left over.

12 She could fill _____ one-quart pitcher(s) and have _____ fl oz left over.

13 How much more lemonade would Shana need to have a half gallon? __________

14 Latoya left school at 3:30 P.M. She walked 4 blocks to the library in 8 minutes. She spent 30 minutes in the library. Then she walked 6 blocks to her house. At what time did Latoya get to her house? Explain. Lesson 9
Write the number in expanded form.

<table>
<thead>
<tr>
<th>Hundred-thousands place</th>
<th>Ten-thousands place</th>
<th>Thousands place</th>
<th>Hundreds place</th>
<th>Tens place</th>
<th>Ones place</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 160,572</td>
<td>100,000</td>
<td>60,000</td>
<td>0</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>2 279,005</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 56,921</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 395,066</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Match the number with its description.

5 307,865  My ten-thousands digit is even but is not 0.
6 711,000  My hundreds digit my tens digit, and my tens digit my ones digit.
7 521,804  The sum of my digits is 11.
8 632,790  My ten-thousands digit my thousands digit.
9 13,061   I’m a six-digit number, and my hundred-thousands digit is even.
Write a number that matches the description.

10 300,000 60,000 10,000 500 70 1

11 6,000 200 9

12 40,000 2,000 50 7

13 The thousands, hundreds, tens, and ones digits are all odd.

14 The hundred-thousands digit is the ones digit.

15 The ten-thousands digit is the ones digit.

16 The hundreds digit is half the tens digit.

17 The sum of my digits is an even number.

18 The ones digit is 3 times the thousands digit.

19 The hundred-thousands digit is the sum of the thousands, hundreds, tens, and ones digits.

20 Challenge I’m a two-digit odd number.
My tens digit is double my ones digit.
I’m a multiple of 7. I’m not 21.

Who am I?  

268 two hundred sixty-eight
Breaking Up Numbers to Add

Find the sum. Break up the numbers before you add. HINT: You do not have to fill in all the boxes.

1. \[ \begin{align*}
53 & = 50 + 3 \\
26 & \quad + \\
\hline
\quad & = \quad + \\
\end{align*} \]

2. \[ \begin{align*}
417 & = \quad + \quad + \\
165 & \quad + \\
\hline
\quad & = \quad + \\
\end{align*} \]

3. \[ \begin{align*}
162 & = \quad + \quad + \\
49 & \quad + \\
\hline
\quad & = \quad + \\
\end{align*} \]

prime 269
**Challenge**

Make up an addition number story and have someone else solve it. Make an answer key with a complete number sentence that goes with the story.

Find the sum. If it helps, break up the numbers before you add.

<table>
<thead>
<tr>
<th></th>
<th>125</th>
<th>27</th>
<th></th>
<th>15</th>
<th>339</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>107</td>
<td>209</td>
<td></td>
<td>226</td>
<td>394</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td>8</td>
<td>272</td>
<td>29</td>
</tr>
<tr>
<td>9</td>
<td>608</td>
<td>195</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

270 two hundred seventy

2 3 3 3 5
Find the difference. Break up the numbers before you subtract.

1. 53 - 26 = 40 + 13

2. 417 - 165 = 400 + 100 + 10

3. 162 - 49 = 100 + 60 + 12

prime 11 two hundred seventy-one 271
### Find the difference.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>167</td>
<td>138</td>
</tr>
<tr>
<td>5</td>
<td>423</td>
<td>91</td>
</tr>
<tr>
<td>6</td>
<td>682</td>
<td>309</td>
</tr>
<tr>
<td>7</td>
<td>384</td>
<td>295</td>
</tr>
<tr>
<td>8</td>
<td>222</td>
<td>87</td>
</tr>
<tr>
<td>9</td>
<td>561</td>
<td>79</td>
</tr>
</tbody>
</table>

### Challenge

Complete the number sentence and write a story to go with it.

121 36

---

272 two hundred seventy-two
Comparing Addition and Subtraction

Complete the related addition and subtraction sentences. You may start with any number sentence.

1. \[ 425 \quad 182 \quad 425 \]

2. \[ 503 \quad 411 \quad 503 \]

3. \[ 619 \quad 295 \quad 619 \]

4. The principal made 375 copies of next year’s school calender. She put 17 copies in different places around the school. She gave the rest to the teachers to give to their students.

Complete these number sentences:

Which sentence tells you how many copies went to the teachers? Explain.

\[ 375 \quad 17 \quad \square \]

\[ 375 \quad 17 \quad \square \]

two hundred seventy-three 273
Complete the addition puzzles.

5  
2 3  
+ 8  
3 0 7

6  
1 9  
+ 8 7  
5 9

7  
7 6  
+ 8  
7 0 9

8 When adding, how do you know if you will need to regroup?

9 Challenge

  
+ 3  
,  

10 Challenge Make your own addition puzzle.

  

274 two hundred seventy-four  CCLXXIV  2 × 137
### Addition Shortcuts and Rounding

Complete the addition sentence.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>14</td>
<td>38</td>
</tr>
<tr>
<td>9</td>
<td>17</td>
<td>13</td>
<td>29</td>
</tr>
<tr>
<td>10</td>
<td>7</td>
<td>15</td>
<td>74</td>
</tr>
<tr>
<td>11</td>
<td>13</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>16</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>344</td>
<td>426</td>
<td>812</td>
</tr>
<tr>
<td>16</td>
<td>13</td>
<td>7</td>
<td>546</td>
</tr>
<tr>
<td>17</td>
<td>16</td>
<td></td>
<td>118</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>133</td>
<td></td>
</tr>
</tbody>
</table>

**CCLXXV** two hundred seventy-five 275
Complete the number puzzle.

276 two hundred seventy-six


County Fair!

The snack bar opened with 35 gallons of lemonade. By noon, 18 gallons had been sold, so 20 more gallons were made. Between noon and 4:00, 24 gallons were sold, so an extra 20 gallons were made. After 4:00, another 26 gallons were sold. How much lemonade was left at the end of the day?

On Saturday, 479 ride tickets were sold. On Sunday, 298 tickets were sold. How many more tickets were sold on Saturday than on Sunday? If each ticket cost $2.00, how much more money was collected on Saturday than on Sunday?

On Saturday, 71 tickets were sold for the Ferris wheel, 58 tickets for the roller coaster, and 83 tickets for the teacups. On Sunday, 68 tickets were sold for the Ferris wheel, 63 tickets for the roller coaster, and 75 tickets for the teacups. Altogether, were more tickets sold on Saturday or on Sunday? How many more?
Sarah drove 335 miles from her house to her grandma’s house. On the way back, she drove 179 miles to her cousin’s house, 175 miles to her friend’s house, and 88 miles from her friend’s house back home. In total, how many more miles did she drive on the way back from her grandma’s house than on the way there?

Challenge Josie bought a 12-foot by 15-foot piece of carpet for her living room. She needs to cut a 5-foot by 9-foot piece of carpet to make room for the stairs. How many square feet of carpet will she actually use for her living room?
1. In January, Sam earned $123 and spent $92. In February, he earned $92 and spent $70. In March, he earned $181 and spent $121. In April, he earned $127 and spent $111. How much money does Sam have now?

$____

2. Ms. Lopez has 14 large boxes of pencils and 14 small boxes of pencils. There are 17 pencils in each large box and 3 pencils in each small box. How many pencils does she have?

_______ pencils

3. Which digit is used least often in the numbers 1 through 100? Explain how you know.

_____

4. Which digit is used most often in the numbers 1 through 100? Explain how you know.

_____
Problem Solving Test Prep

Choose the correct answer.

1. What is the product if the number shown below is multiplied by 3?

A. 702  
B. 602  
C. 468  
D. 234

2. Use the number line to find the missing addend.

15 16 17 18 19 20 21 22 23

A. 3  
B. 4  
C. 5  
D. 6

3. What is the value of the 6 in this number? 26,905

A. 60  
B. 600  
C. 6,000  
D. 60,000

4. A town map has horizontal and vertical streets. Each horizontal street intersects with each vertical street. There are 15 intersections. How many horizontal streets could there be?

A. 3  
B. 4  
C. 6  
D. 10

Show What You Know

Solve the problem. Explain your answer.

5. The table shows how many buttons the third-grade classes collected. Which two classes collected exactly 1,517 buttons?

<table>
<thead>
<tr>
<th>Class</th>
<th>Buttons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room 201</td>
<td>833</td>
</tr>
<tr>
<td>Room 203</td>
<td>764</td>
</tr>
<tr>
<td>Room 207</td>
<td>684</td>
</tr>
<tr>
<td>Room 209</td>
<td>763</td>
</tr>
</tbody>
</table>

280 two hundred eight  CCLXXX  2 2 2 5 7
Chapter 14
Review/Assessment

NCTM Standards 1, 2, 6, 7, 9, 10

1. I have 0 hundreds. I have 5 tens. I have 8 thousands. I have 3 ones. I have 0 ten thousands. What number am I?  

2. Write a number in each box. I am 685. 
   - I have ___ ones. 
   - I have ___ hundreds. 
   - I have ___ tens. 
   - I have ___ thousands. 

Write the number in expanded form. 

<table>
<thead>
<tr>
<th>Hundred-thousands place</th>
<th>Ten-thousands place</th>
<th>Thousands place</th>
<th>Hundreds place</th>
<th>Tens place</th>
<th>Ones place</th>
</tr>
</thead>
<tbody>
<tr>
<td>50,186</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7,322</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>463</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>409,251</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Find the sum or difference. 

7. 26 + 55 = 81  
8. 83 − 38 = 45

prime  ! ! !  two hundred eighty-one 281
Complete the number sentence. Lesson 4

9  207  177 "  

10  391  115 "

11  

12  

There are 144 tiles on the bathroom floor. There are 49 green tiles, 25 white tiles, and the rest of the tiles are blue. How many tiles are blue? Lesson 6

___ tiles

Jeremy has $6.80. He spends $1.15 for a granola bar and $2.49 for a salad. How much money does Jeremy have left? Lesson 7

$ ___

282  two hundred eighty-two  ! ! !  2 ! 3 ! 47
Use the array of dimes to complete the number sentences.

1. 4 70  

2. 30  3  

3.  

NCTM Standards 1, 2, 6, 7, 8, 9, 10

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Name ___________________________  Date/Time ________
Complete the number sentence.

4

\[
\begin{array}{c}
60 \\
5
\end{array}
\]

5

\[
\begin{array}{c}
60 \\
50
\end{array}
\]

6

\[
\begin{array}{c}
80 \\
240
\end{array}
\]

7

\[
\begin{array}{c}
12 \\
840
\end{array}
\]

8

\[
\begin{array}{c}
6 \\
540
\end{array}
\]

Solve.

Mrs. Wheeler bought special pencils for each of the 40 children who ride her bus. Each pencil costs 12¢. How much did she spend for all the pencils? Explain how you found your answer.

There are 60 minutes in 1 hour. How many minutes are there in 8 hours?

Challenge Miko made this array of nickels. Write some multiplication sentences this array could represent.
Separating Large Arrays

Complete the diagram and find the product.

1. \[
\begin{array}{c}
10 \\
100 \ 70 \\
5 \\
50 \ 35 \\
\end{array}
\]

2. \[
\begin{array}{c}
10 \\
20 \ 8 \\
4 \\
\end{array}
\]

3. \[
\begin{array}{c}
20 \\
10 \ 3 \\
9 \\
\end{array}
\]

4. \[
\begin{array}{c}
20 \\
20 \ 7 \\
9 \\
\end{array}
\]

CCLXXXV \two hundred eighty-five \ 285
Find the product. Complete the diagram if it helps.

5  
\[
\begin{array}{c}
\ 26 \\
15
\end{array}
\]

6  
\[
\begin{array}{c}
\ 25 \\
23
\end{array}
\]

Solve. Draw a diagram if it helps.

9 Paolo’s garden measures 28 feet by 15 feet. What is the area of his garden?

10 **Challenge** Jackie has 37 quarters. How much money does she have?
Complete the diagram and the vertical record.

1

\[
\begin{array}{c}
10 \\
\{ \\
100 \\
30 \\
\}
\end{array}
\]

2

\[
\begin{array}{c}
13 \\
\{ \\
100 \\
30 \\
\}
\end{array}
\]

3

\[
\begin{array}{c}
20 \\
\{ \\
30 \\
6 \\
\}
\end{array}
\]

4

\[
\begin{array}{c}
30 \\
\{ \\
30 \\
8 \\
\}
\end{array}
\]
Find the product. Draw a diagram if it helps.

5 28
   28

6 27
   29

7 33
   33

8 32
   34

Solve.

9 Three planes each make 8 flights to the desert. Each plane can take 45 boxes of bottled water. How many boxes of bottled water are delivered?

10 Challenge Jasmine is selling knitted scarves at the craft fair for $15.00. She wants to buy candles for $8.00 each. If Jasmine sells 38 scarves, how many candles can she buy?
Multiplying Three-Digit Numbers

Use base-ten block shorthand (□, □, |, ;) to find the product.

1. 314 4 ______

2. 3 162 ______

Use money shorthand ( $1, $, ¢) to find the product.

3. 3 251 ______

4. 472 2 ______
Complete the diagram and find the product.

1. 

\[ \begin{array}{c}
100 \\
30 \\
2 \\
7 \\
\end{array} \]

\[ \begin{array}{c}
132 \\
7 \\
\end{array} \]

2. 

\[ \begin{array}{c}
200 \\
50 \\
6 \\
4 \\
\end{array} \]

\[ \begin{array}{c}
4 \\
256 \\
\end{array} \]

3. 

\[ \begin{array}{c}
300 \\
10 \\
7 \\
5 \\
\end{array} \]

\[ \begin{array}{c}
5 \\
317 \\
\end{array} \]

4. 

\[ \begin{array}{c}
100 \\
90 \\
6 \\
8 \\
\end{array} \]

\[ \begin{array}{c}
8 \\
305 \\
\end{array} \]

Challenge: Find 236 \times 6.

290 two hundred ninety CCXC 2 5 29
Complete the related number sentences for each story.

1. Devi has 48 toy cars. He parked them in 3 rows, with ____ cars in each row.
   - \[ 48 \div 3 = 16 \]
   - \[ 3 \times 16 = 48 \]

2. Hanae has 15 nickels in her coin bank. How much money does she have?
   - \[ 15 \times 5 = 75 \]

3. It is 13 weeks until Ki’s birthday. How many days until Ki’s birthday?
   - \[ 13 \times 7 = 91 \]

4. The baker arranged 56 fruit tarts on 4 trays. If he put the same number of tarts on each tray, how many were on a tray?
   - \[ 56 \div 4 = 14 \]

NCTM Standards 1, 2, 6, 7, 8, 9, 10
Complete the related number sentences. Write a story for the sentences using the suggested topic.

<table>
<thead>
<tr>
<th>Related Number Sentences</th>
<th>Topic</th>
<th>Story</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quarters</td>
<td></td>
</tr>
<tr>
<td>8 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>132 11</td>
<td>Lines and Intersections</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 7</td>
<td>Ounces and Pounds (16 oz 1 lb)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Challenge** Fill in each table with numbers that make the sentence true.

**A**

<table>
<thead>
<tr>
<th>A</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Triangle]</td>
<td>![Pentagon]</td>
</tr>
</tbody>
</table>

**B**

<table>
<thead>
<tr>
<th>B</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Triangle]</td>
<td>![Diamond]</td>
</tr>
</tbody>
</table>

292 two hundred ninety-two  CCXCI1  2 2 73
Using Arrays for Division

Fill in the missing numbers.

1

3 \[ \begin{array}{c}
\hline
10 \\
\hline
4 \\
\hline
3 \end{array} \]

3 \[ \begin{array}{c}
\hline
30 \\
\hline
12 \\
\hline
42 \\
\hline
3 \\
\hline
\end{array} \]

2

5 \[ \begin{array}{c}
\hline
20 \\
\hline
5 \\
\hline
5 \end{array} \]

5 \[ \begin{array}{c}
\hline
100 \\
\hline
\end{array} \]

5 \[ \begin{array}{c}
\hline
\end{array} \]

3

8 \[ \begin{array}{c}
\hline
20 \\
\hline
7 \\
\hline
8 \end{array} \]

8 \[ \begin{array}{c}
\hline
\end{array} \]

prime CCXCIII two hundred ninety-three 293
Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

1. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

2. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

3. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

4. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

5. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

6. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

7. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

8. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

9. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

10. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

11. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

12. Solve these division puzzles. You may draw diagrams on a separate piece of paper if it helps.

13. **Challenge** Bea is running the forklift. She can lift 8 crates at a time, each with the same number of toaster ovens. At each lift, she holds 192 toaster ovens. How many ovens are in each crate?

294 two hundred ninety-four  CCXCVI  294
Lesson 7

Solving Division Puzzles

NCTM Standards 1, 2, 6, 7, 9, 10

1. Complete the table.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use the table to help you make division puzzles to solve the division problems below.

Remember: 1. The first part must be a multiple of 10.
2. Make the second part as small as possible.
3. Use only whole numbers.

2. \[ \frac{147}{7} \]
   \[ 7 \] \[ 140 \]

3. \[ \frac{224}{7} \]
   \[ 7 \] \[ \square \] \[ \square \]

4. \[ \frac{301}{7} \]
   \[ 7 \] \[ \square \] \[ \square \]

5. \[ \frac{378}{7} \]
   \[ 7 \] \[ \square \] \[ \square \]

6. \[ \frac{455}{7} \]
   \[ 7 \] \[ \square \] \[ \square \]

7. \[ \frac{532}{7} \]
   \[ 7 \] \[ \square \] \[ \square \]

59  CCXCV  two hundred ninety-five 295
Make a division puzzle that will help you solve each division problem.

\[
\begin{array}{c}
8 & 336 & 8! & \boxed{4} \\
& & \boxed{\boxed{4}} & \boxed{8} \\
\hline
& & \boxed{\boxed{6}} & \boxed{6} \\
\end{array}
\]

Think about multiples of 80.

\[
\begin{array}{c}
9 & 576 & 6! & \boxed{9} \\
& & \boxed{\boxed{6}} & \boxed{9} \\
\hline
& & \boxed{\boxed{2}} & \boxed{2} \\
\end{array}
\]

Think about multiples of 60.

\[
\begin{array}{c}
10 & 328 & 4! & \boxed{4} \\
& & \boxed{\boxed{4}} & \boxed{4} \\
\hline
& & \boxed{\boxed{2}} & \boxed{2} \\
\end{array}
\]

\[
\begin{array}{c}
11 & 378 & 9! & \boxed{9} \\
& & \boxed{\boxed{9}} & \boxed{9} \\
\hline
& & \boxed{\boxed{2}} & \boxed{37} \\
\end{array}
\]

Challenge Shana packs a dozen roses in each box. If she has 910 roses, how many full boxes can she pack? How many roses will be left over?
Shawn made 128 muffins. He packed them in baskets with 7 muffins in each.

1. How many full baskets did he make?

2. How many muffins were left over?

128 people have signed up for the Vans Across America trip. Each van can take 7 people.

3. How many vans are needed for the trip? Explain how you know.

4. How many empty seats are there? Explain how you know.
Solve.

5 Ms. Kennedy’s class tried to make groups of 3 for an activity, but 2 students were left over. How many students might be in Ms. Kennedy’s class? (There are more than 12 students and fewer than 30.)

Ms. Kennedy’s class decided to make groups of 4 for the activity. This time no students were left over. Which is the number of students in the class?

Challenge  Mr. Tan’s class can make groups of 2 or 3 without any students left over, but when they make groups of 5 there are 3 students left over. Mr. Tan has fewer than 30 students. How many students are in Mr. Tan’s class?
1. Derek wants to buy 4 stuffed animals. Each one costs $2.13. How much money does Derek need? Draw a picture to show how you solved the problem.

2. There are about 320 third graders in Belltown. There are about 20 students in each classroom. About how many third-grade classrooms are there in Belltown?

3. It is 84 days until Rashid’s birthday. How many weeks is that?
Problem Solving Test Prep

Choose the correct answer.

1 The picture shows the division expression $\frac{11}{3}$. What is the remainder?

A. 1
B. 2
C. 3
D. 11

3 Danny left the movie theater at 3:45 P.M. when the movie ended. The movie he saw lasted 2 hours 10 minutes. At what time did the movie start?

A. 12:35 P.M.
B. 1:25 P.M.
C. 1:35 P.M.
D. 1:45 P.M.

2 Which multiplication expression has the product 24,000?

A. $8 \times 30$
B. $8 \times 300$
C. $8 \times 3,000$
D. $8 \times 30,000$

4 Marita has some three-dimensional figures. Which figure must have faces that are triangles?

A. prism
B. cone
C. cylinder
D. pyramid

Show What You Know

Solve the problem. Explain your answer.

5 Linda’s kitchen floor is a rectangle that is 12 feet by 11 feet. She has square tiles that are 2 feet on each side. Can she exactly cover the floor without cutting any tiles?

6 Mikel is sharing 31 markers among 3 friends and himself. He shares as evenly as he can. Mikel keeps the leftover markers. How many markers does he have?
1. Use the array of dimes to complete the number sentences.

   5  12
   5  120
   50  12

2. Complete the diagram and the number sentence.

   \[
   \begin{array}{c}
   10 \\
   7 \\
   \hline
   20 \\
   56 \\
   \hline
   \end{array}
   \]

3. Complete the diagram and the vertical record.

   \[
   \begin{array}{c}
   30 \\
   2 \\
   \hline
   10 \\
   6 \\
   \hline
   32 \\
   16 \\
   \hline
   \end{array}
   \]

4. Draw a diagram to help you find the product.

   \[
   \begin{array}{c}
   142 \\
   8 \\
   \hline
   7 \\
   43 \\
   \hline
   \end{array}
   \]

...
5 Complete the related number sentences for the story. Lesson 5
Shai made 8 stacks of coins. Each stack had a quarter and a dime. How much money did Shai use?

\[
\begin{align*}
\text{Quarters:} & \quad 8 \times \quad \frac{1}{4} \\
\text{Dimes:} & \quad 8 \times \quad 0.10 \\
\text{Total:} & \quad 8 \times \quad 0.35 \\
\end{align*}
\]

Fill in the missing numbers. Lesson 6

\[
\begin{align*}
7 \times \quad 20 & = \quad 3 \times \quad 7 \\
\end{align*}
\]

Solve the division puzzle. Lessons 6 and 7

7

\[
\begin{array}{c}
11 \overline{)330} \\
\quad \overline{30}} \\
\quad \overline{3} \\
\end{array}
\]

8

\[
\begin{array}{c}
7 \overline{)420} \\
\quad \overline{35}} \\
\quad \overline{15} \\
\end{array}
\]

Solve. Lessons 8 and 9

There are 335 horses going to the Summer Stampede Horse Show from Vast Acres farm. 9 horses fit in each horse van.

A How many vans are needed?

\[
\begin{align*}
335 \div 9 & = 37 \ldots 2 \\
\end{align*}
\]

B If each van is filled, then sent off, how many horses are in the last van?

\[
\begin{align*}
2 \div 9 & = \text{remainder 2} \\
\end{align*}
\]

302 three hundred two  CCCII  2  151