

• Multiplying Two-Digit Numbers, Part 1

Power Up

facts

Power Up 81

jump start

 Count up by 12s from 0 to 120.
Count up by 5s from 4 to 94.

 Write two multiplication facts using the numbers 3, 7, and 21.

 Draw a 7-centimeter segment on your worksheet.

mental math

a. **Number Sense:** $56 + 27$

b. **Number Sense:** $82 + 18$

c. **Number Sense:** $450 - 400$

d. **Measurement:** Which is the higher temperature, 32°F or 5°C ?

problem solving

How many times does the minute hand go around a clock in one day?

New Concept

When we double a number, we multiply the number by 2. For example, when we double 6, we have 2 groups of 6, or 12.

$$6 + 6 = 12$$

$$2 \times 6 = 12$$

We have learned multiplication facts for 2. In this lesson we will practice multiplying two-digit numbers by 2.

Connect List some things that you use or see in real life that come in pairs or doubles.

 **Activity****Doubling Money**

Use your money manipulatives to solve these problems.

1. Mariya has \$24. If she doubles her money, how much money will she have?

Step 1: Place 2 tens and 4 ones on your desk.

Step 2: Double the money by placing 2 more tens and 4 more ones on your desk.

Step 3: Combine the bills. What is the total?

2. Irena has \$48. If she doubles her money, how much money will she have?

Step 1: Place 4 tens and 8 ones on your desk.

Step 2: Double the money by placing 4 more tens and 8 more ones on your desk.

Step 3: Combine the bills. Trade with the bank if you can.

Step 4: What is the total?

Here is how we multiply \$24 by 2 using pencil and paper:

Set up. Multiply 4 ones by 2. Multiply 2 tens by 2.

$$\begin{array}{r} \$24 \\ \times \quad 2 \\ \hline \end{array}$$

$$\begin{array}{r} \$24 \\ \times \quad 2 \\ \hline 8 \end{array}$$

$$\begin{array}{r} \$24 \\ \times \quad 2 \\ \hline \$48 \end{array}$$

Here is how we multiply \$48 by 2 using pencil and paper:

Set up. Multiply 8 ones by 2. Multiply 4 tens by 2.

$$\begin{array}{r} \$48 \\ \times \quad 2 \\ \hline \end{array}$$

$$\begin{array}{r} \\ \$48 \\ \times \quad 2 \\ \hline 6 \end{array}$$

$$\begin{array}{r} \\ \$48 \\ \times \quad 2 \\ \hline \$96 \end{array}$$

When we multiply 8 ones by 2, the product is 16. Sixteen is 1 ten and 6 ones. We write the 6 in the ones place and the 1 ten above the 4 tens of 48.

When we multiply 4 tens by 2, the product is 8 tens. We add the 1 ten from 16 which makes 9 tens. The product is \$96.

Example 1

A ticket to the amusement park costs \$34. How much would two tickets cost?

To find the answer, we can add \$34 and \$34, or we can multiply \$34 by 2. Either way, we find the cost of two tickets is **\$68**.

$$\begin{array}{r} \text{Add} \\ \$34 \\ + \$34 \\ \hline \$68 \end{array}$$

$$\begin{array}{r} \text{Multiply} \\ \$34 \\ \times 2 \\ \hline \$68 \end{array}$$

Example 2

One yard is 36 inches. How many inches is two yards?

We can find the answer by adding or multiplying. Either way, we find that two yards is **72 inches**.

$$\begin{array}{r} 1 \\ 36 \\ + 36 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 1 \\ 36 \\ \times 2 \\ \hline 72 \end{array}$$

Lesson Practice

Find each product.

a. $\begin{array}{r} \$14 \\ \times 2 \\ \hline \end{array}$

b. $\begin{array}{r} 43 \\ \times 2 \\ \hline \end{array}$

c. $\begin{array}{r} \$27 \\ \times 2 \\ \hline \end{array}$

d. $\begin{array}{r} 39 \\ \times 2 \\ \hline \end{array}$

- e. July and August each have 31 days. Altogether, how many days are in July and August? Find the answer by multiplying.
- f. One pair of shoes costs \$45. What would two pairs of the shoes cost? Find the answer by multiplying.

Written Practice

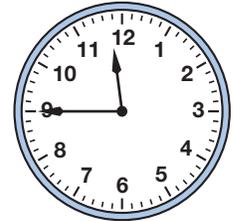
Distributed and Integrated

1. **Analyze** (60, 79) The ceiling is 3 meters high. How many centimeters is 3 meters?

2. ^(28, 36) The class has collected 73 pounds of aluminum cans. The goal is to collect 100 pounds. How many more pounds of cans does the class need to collect to reach the goal?

3. **Connect** ^(2, 32) Write the next three numbers in the sequence below.
2,000, 4,000, 6,000, _____, _____, _____, ...

4. ⁽³⁾ It's time for lunch. Write the time shown on the clock in digital form.



5. **Multiple Choice** ⁽⁵⁵⁾ Which of these multiplication facts equals 24? List all correct answers.

- A** 3×6 **B** 2×12 **C** 1×24 **D** 4×6

6. ⁽²⁵⁾ What is the total value of five quarters, five dimes, five nickels, and five pennies?

7. **Multiple Choice** ⁽³²⁾ Which shows three tens and four thousands?
A 34,000 **B** 4,003 **C** 4,030 **D** 30,004

8. **Analyze** ⁽⁷⁹⁾ Half of a dollar is equal to 50 cents. How many centimeters are equal to half of a meter?

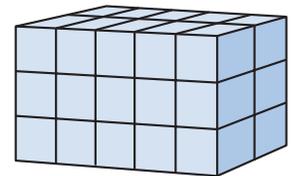
9. Multiply: ⁽⁸¹⁾
a. 2×24 **b.** 2×48

10. ^(72, 73) A box is filled with cubes as shown at right.
a. How many cubes are in each layer?

b. How many layers are there?

c. How many cubes are there?

d. If each cube is one cubic inch, what is the volume of all of these cubes?



11. ^(46, 49) Write a fraction equal to one with a denominator of 5. Then write the mixed number one and one fifth using digits and symbols. Which number is greater?

12. Find each product:

(70)

a. 9×8

b. 7×8

c. 3×7

13. Here is a drawing of a brick:

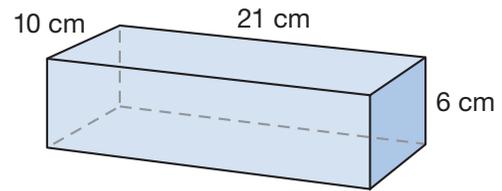
(71)

a. What is the length of the brick?

b. What is the width of the brick?

c. What is the height of the brick?

d. What is the name for the shape of the brick?

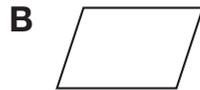


14. What is the area of the top of the brick in problem 13?

(56, 62)

15. **Multiple Choice** Which figure is *not* a parallelogram?

(66)



16. Find each product:

(77, 78)

a. $2 \times 5 \times 4$

b. 6×50

17. Find each product:

(78)

a. 4×70

b. 6×60

c. 9×40

Add or subtract, as shown below:

18. $\$10.00 - \5.60

(26, 28)

19. $\$95 + \$85 + \$75$

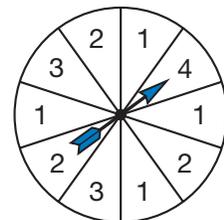
(24)

20. a. The spinner is least likely to stop on what number?

(44, 50)

b. The spinner is most likely to stop on what number?

c. What fraction of the face of the spinner has the number 2?



Early Finishers

Real-World Connection

Nancy practiced basketball for 1 hour and 45 minutes on Friday and 1 hour and 15 minutes on Saturday. Jenny practiced for 1 and one half hours on Friday and 120 minutes on Saturday. How many minutes did each girl practice over two days? Who practiced longer?

• Fair Share

Power Up

facts

Power Up 82

jump
start

-  Count up by halves from 0 to 5.
Count up by fourths from 0 to 2.

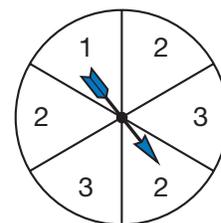
-  Write these numbers in order from least to greatest:

$$\frac{1}{2} \quad 1\frac{1}{2} \quad \frac{3}{4} \quad 3$$

-  Draw an equilateral triangle. Use a crayon to trace the sides that have equal length.

mental
math

- a. **Money:** $\$1.65 + \2.00
b. **Number Sense:** $37 + 52$
c. **Number Sense:** $620 - 100$
d. **Probability:** Hector spins the spinner one time. Which number is the spinner most likely to land on?

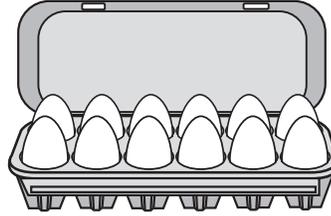
problem
solving

The area of Tandy's rectangular bedroom window is 12 square feet. The height of her window is 4 feet. What is the length of her window?

New Concept

We saw in Lesson 81 that when we double a number, we multiply the number by 2. In this lesson, we will use manipulatives and pictures to find half of a number. When we find half of a number, we divide the number into two equal parts and find the number in each part.

Below we show a **dozen** eggs in a carton. There are two rows of 6 eggs.



The picture shows that doubling 6 equals 12. The picture also shows that half of 12 is 6.

Activity

Fair Share

Materials: counters or tiles

1. Place 16 counters or tiles on your desk. Then separate the items into 2 equal groups. How many items are in each group?
2. Place 24 counters or tiles on your desk. Then separate the items into 2 equal groups. How many items are in each group?

There are two ways to show a number divided into 2 parts using pencil and paper.

$$24 \div 2 = 12$$

$$\begin{array}{r} 12 \\ 2 \overline{)24} \end{array}$$

“24 divided by 2 equals 12.” “24 divided by 2 equals 12.”

Connect If multiplication is the same as repeated addition, what do you think division is the same as?

Example 1

Draw a total of 14 Xs on your paper. Arrange the Xs in two rows like this:

X X X ...

X X X ...

How many Xs are in each row? Use digits and symbols to show two ways to write the division of 14 into 2 equal groups.

We write 14 Xs in 2 rows. There are 7 Xs in each row.

X X X X X X X

X X X X X X X

The pattern of Xs shows that 14 divided by 2 is 7.

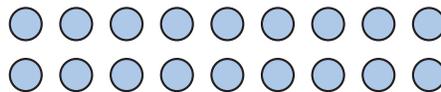
$$14 \div 2 = 7$$

$$\begin{array}{r} 7 \\ 2 \overline{)14} \end{array}$$

Example 2

Eighteen students line up in 2 equal rows. How many students are in each row? Use digits and symbols to show two ways to write the division of 18 into 2 equal groups.

We can use counters or draw pictures to help us divide 18 into 2 equal groups.



Since 18 divides into 2 equal groups of 9, there are **9 students** in each row.

$$18 \div 2 = 9$$

$$\begin{array}{r} 9 \\ 2 \overline{)18} \end{array}$$

Lesson Practice

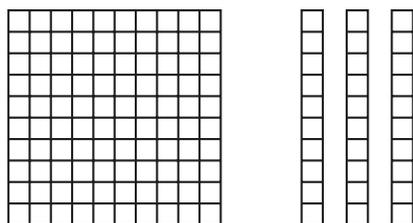
- We find half of a number by dividing by 2. We can use two open hands to show 10 divided by 2. What number is half of 10?
- Use counters to find half of 12.
- Draw a total of 8 Xs on your paper arranged in 2 equal rows. How many Xs are in each row? Show two ways to write the division of 8 into 2 parts.
- Twenty students lined up in two equal rows. How many students were in each row?

1. Brandon ran 5 kilometers. How many meters is 5 kilometers?
(79)
2. Tamara bought a telescope for \$189.00. Tax was \$13.23. What was the total price with tax?
(22, 36)
3. **Analyze** On Monday Joni read 15 pages. On Tuesday Joni read twice as many pages as she read Monday. How many pages did Joni read Tuesday?
(81)
4. **Multiple Choice** Which of these multiplication facts does *not* equal 18?
(55)

A 3×6 **B** 9×9 **C** 18×1 **D** 2×9
5. **Multiple Choice** Bobby is five years old. Which of these could be his height?
(79)

A 100 m **B** 100 cm **C** 100 km

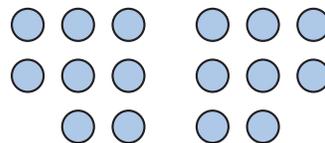
6. What number is shown by this model?
(11)



7. Marla arranged 16 counters to show half of 16. What number is half of 16?
(82)
8. **Represent** Draw a square with sides 5 cm long.
(51, 79)
9. **a.** What is the perimeter of the square in problem 8?
(58, 62)

b. What is the area of the square?
10. Find each product.
(77, 81)

a. $5 \times 4 \times 3$ **b.** 2×25

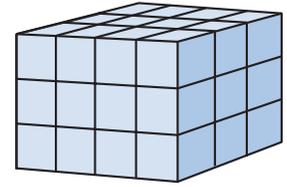


11. What is the place value of the 2 in 751,283?
(32)

12. Cubes are stacked as shown at right.

(72, 73)

- a. How many cubes are in each layer?
- b. How many layers are there?
- c. How many cubes are there?
- d. If each cube is one cubic centimeter, what is the volume of the stack of cubes?



13. Multiply:

(70, 78)

a. 6×7

b. 7×80

c. 8×90

Add or subtract:

14. $\$4.58 + \8.97

(22)

15. $\$800 - \735

(28)

16. Find the missing addend: $24 + m = 100$.

(9, 28)

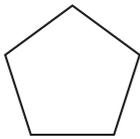
17. Write 57,240 in expanded form.

(32)

18. What is the name of each polygon?

(67)

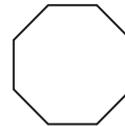
a.



b.



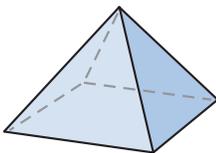
c.



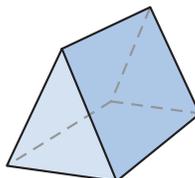
19. What is the name of each solid?

(75)

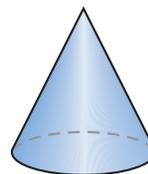
a.



b.



c.



20. Which of the measures below is reasonable for the mass of a grape?

(80)

6 grams

6 kilograms

• Finding Half of a Number

Power Up

facts

Power Up 83

jump start



Count up by 7s from 0 to 77.
Count up by 100s from 0 to 2,000.

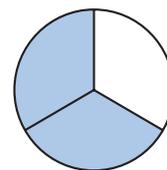


Write “fifty thousand, four hundred one” using digits.
What number is in the ten thousands place?

Label the number line by halves from 5 to 10. (Show these numbers: 5 , $5\frac{1}{2}$, 6 , $6\frac{1}{2}$, 7 , $7\frac{1}{2}$, 8 , $8\frac{1}{2}$, 9 , $9\frac{1}{2}$, 10 .)

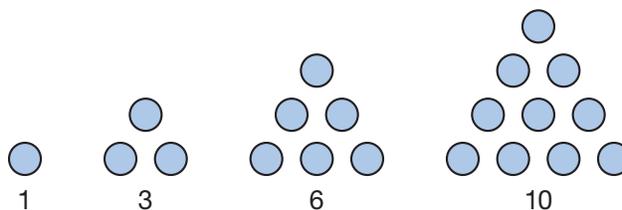
mental math

- Measurement:** How many inches are in 4 feet?
- Money:** $\$10.00 - \9.25
- Number Sense:** $67 + 34$
- Fractions:** What fraction of the circle is *not* shaded?



problem solving

Shawntel used pennies to make the patterns below. How many pennies does she need to build the next triangular pattern?



New Concept

A multiplication table is a collection of multiplication facts. It is also a collection of division facts. In this lesson we will use a multiplication table to divide by 2.

	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

If we want to divide 12 by 2, we look at the row that begins with 2. Then we look across the row for 12. When we find 12, we look at the top of the column and find 6. We see that 12 divided by 2 is 6. We can write $12 \div 2 = 6$ or $\begin{array}{r} 6 \\ 2 \overline{)12} \end{array}$.

Connect What multiplication fact is related to $12 \div 2 = 6$?

Example 1

Use the multiplication table to find half of 22.

To find half of 22, we divide 22 by 2. We look across the 2s row for 22. We see 22 and look at the top of the column and find 11. Half of 22 is **11**.

Example 2

Drew and his sister bought a game that cost \$18. They both paid half of the price. How much money did Drew pay?

We find half of \$18 by dividing \$18 by 2. We find 18 in the row for 2. We look at the top of the column and see 9. Drew paid \$9.

Lesson Practice

- One day is 24 hours. How many hours is half of a day?
- Sixteen ounces equals a pound. How many ounces is half of a pound?

Find each answer on the multiplication table.

c. $2 \overline{)14}$

d. $8 \div 2$

Written Practice

Distributed and Integrated

- (20, 26) T-shirts were on sale for \$2.00 off the regular price. If the regular price was \$8.95, what was the sale price?
- (21, 56) **Analyze** Michelle bought ten pens for 89¢ each. What was the total price of the ten pens?

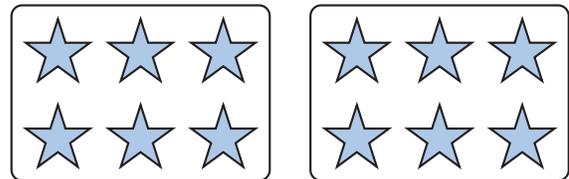
- (82, 83) **Multiple Choice** Divide 12 into two equal groups. What is half of 12?

A $\frac{1}{2}$

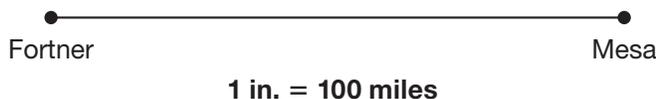
B 6

C 2

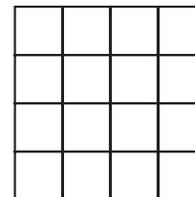
D 12



- (35) Computer chips were shipped from Fortner to Mesa. Use your ruler to find the distance from Fortner to Mesa.



13. Carla made this rectangle out of floor tiles that were one-foot squares.



- How long is the rectangle?
- How wide is the rectangle?
- What is the area of the rectangle?
- What kind of rectangle is it?

14. Change the addition below to multiplication and find the total.

(54)

$$10 \text{ cm} + 10 \text{ cm} + 10 \text{ cm} + 10 \text{ cm} + 10 \text{ cm}$$

15. Find each product:

(78)

a. 4×80

b. 3×90

c. 6×70

16. $\$35 + \$47 + \$176$

(24)

17. $\$12.48 - \6.97

(26)

18. 2×57

(81)

19. $3 \times 4 \times 5$

(77)

20. **Model** Use a centimeter ruler to measure the distances between these points:

(79)



- How many centimeters is it from point A to point B?
- How many centimeters is it from point B to point C?
- Use your answers to a and b to find the number of centimeters from point A to point C.

Early Finishers

Real-World Connection

Aiesha has 2 bags of pretzels with 24 pretzels in each bag. She wants to share the pretzels with 5 friends. How many pretzels should Aiesha and her friends each have?

• Multiplying Two-Digit Numbers, Part 2

Power Up

facts

Power Up 84

jump start

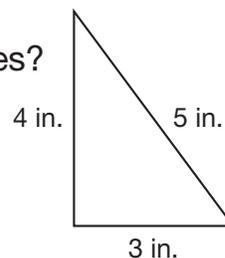
-  Count up by 25s from 0 to 250.
Count up by 10s from 7 to 97.

-  Draw an array to show the multiplication fact 3×4 .

-  Draw a 12-centimeter segment on your worksheet.

mental math

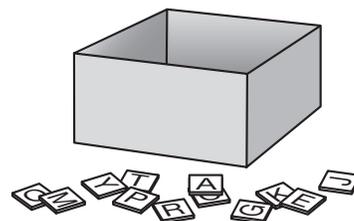
- a. **Number Sense:** $55 + 35$
b. **Time:** How many years are in 9 centuries?
c. **Measurement:** What is the perimeter of the triangle?
d. **Geometry:** What type of triangle is shown in problem c?



problem solving

Kelly has 26 square tiles. There is one tile for each letter of the alphabet. Kelly will place the tiles in a box, mix them up, and then draw one tile. Which one of these outcomes is most likely to happen? Explain your reasoning.

- A** Kelly will draw the letter R.
B Kelly will draw a vowel.
C Kelly will draw a consonant.



New Concept

In Lesson 81 we multiplied two-digit numbers by 2. In this lesson we will multiply two-digit numbers by other numbers.

We know that a quarter is 25¢ and that 3 quarters total 75¢.



Below we show the multiplication:

Set up.

$$\begin{array}{r} 25¢ \\ \times 3 \\ \hline \end{array}$$

Multiply 5 ones by 3.

$$\begin{array}{r} 1 \\ 25¢ \\ \uparrow \\ \times 3 \\ \hline 5 \end{array}$$

Multiply 2 tens by 3.

$$\begin{array}{r} 1 \\ 25¢ \\ \uparrow \\ \times 3 \\ \hline 75¢ \end{array}$$

When we multiply 5 ones by 3 the product is 15, which is 1 ten and 5 ones. We write 5 ones in the ones place and write the 1 ten above the 2.

When we multiply 2 tens by 3 the product is 6 tens. After multiplying we add the 1 ten for a total of 7 tens.

Analyze Write the multiplication above as addition.

Example 1

One foot is 12 inches. Mr. Simms is 6 feet tall. How many inches tall is Mr. Simms?

We find the number of inches in 6 feet by multiplying 12 inches by 6.

Set up.

$$\begin{array}{r} 12 \\ \times 6 \\ \hline \end{array}$$

Multiply 2 ones by 6.

$$\begin{array}{r} 1 \\ 12 \\ \uparrow \\ \times 6 \\ \hline 2 \end{array}$$

Multiply 1 ten by 6.

$$\begin{array}{r} 1 \\ 12 \\ \uparrow \\ \times 6 \\ \hline 72 \end{array}$$

Mr. Simms is **72 inches** tall.

Example 2

The walls of a square classroom are 32 feet long. What is the perimeter of the room?



32 feet

Each side of the square is 32 feet. Instead of adding four 32s, we will multiply 32 ft by 4.

Set up. Multiply 2 ones by 4. Multiply 3 tens by 4.

$$\begin{array}{r} 32 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 32 \\ \uparrow \\ \times 4 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$$

The perimeter of the room is **128 feet**.

Example 3

Find the product: 5×26

We write 26 above and 5 below with the 6 and 5 aligned in the ones place.

$$\begin{array}{r} 26 \\ \times 5 \\ \hline \end{array}$$

We multiply 6 ones by 5. The product is 30, which is 3 tens and 0 ones. We write 0 in the ones place and 3 above the 2.

$$\begin{array}{r} 3 \\ 26 \\ \times 5 \\ \hline 0 \end{array}$$

Then we multiply 2 tens by 5. The product is 10 tens. Then we add the 3 tens for a total of 13 tens. We write 130, which is 1 hundred and 3 tens.

$$\begin{array}{r} 3 \\ 26 \\ \times 5 \\ \hline 130 \end{array}$$

The product of 5×26 is **130**.

Lesson Practice

Find each product.

a. $\begin{array}{r} 12 \\ \times 4 \\ \hline \end{array}$

b. $\begin{array}{r} 21 \\ \times 5 \\ \hline \end{array}$

c. $\begin{array}{r} 15 \\ \times 4 \\ \hline \end{array}$

d. $\begin{array}{r} 35 \\ \times 3 \\ \hline \end{array}$

e. A foot is 12 inches. The ceiling is 8 feet high. How many inches high is the ceiling?

f. A pound is 16 ounces. Leon weighed 7 pounds when he was born. How many ounces is 7 pounds?

1. **Analyze** In each of the seven classrooms, there were 30 students. How many students were in all seven classrooms?

2. Sixty-four students rode the bus for the field trip. The bus could hold 72 students. There was room on the bus for how many more students?

3. **Analyze** Denise bought ten 42¢ stamps. How much did she pay for the stamps?

4. **Analyze** An African elephant can weigh 7 tons. How many pounds is 7 tons?

5. Name the fraction or mixed number shown on each number line below.



6. **Analyze** A pound is 16 ounces. How many ounces is half of a pound?

7. Three multiplication facts that equal 12 are 1×12 , 2×6 , and 3×4 . Write three multiplication facts that equal 18.

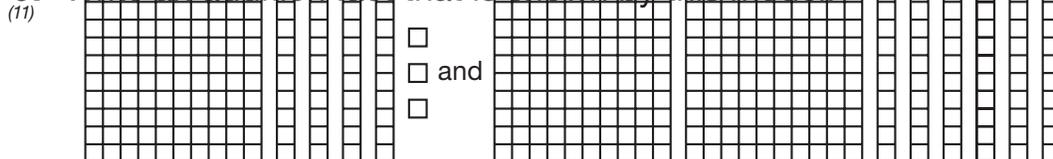
8. **Multiple Choice** The Olsens drove along the open highway. In one hour they could have traveled about how far?

A 100 m

B 100 cm

C 100 km

9. Write an addition fact that is shown by this model.



10. Find each product.

a. 2×30

b. 2×31

11. Find each product.

(84)

a. 3×31

b. 4×31

12. One-inch cubes were used to build the rectangular prism at right.

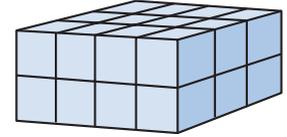
(72, 73)

a. How many inches long is it?

b. How many inches wide is it?

c. How many inches high is it?

d. What is its volume?



13. Multiply:

(78)

a. 7×80

b. 8×60

c. 7×60

Add or subtract, as shown below:

14. $\$20.00 - \12.87

(26, 28)

15. $96\text{¢} + 87\text{¢} + 79\text{¢}$

(22, 24)

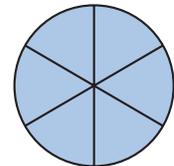
16. Use money to multiply $3 \times \$24$.

(84)

17. a. The shaded circle at right represents which fraction name for 1?

(42, 46)

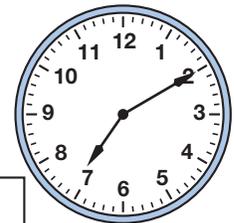
b. Draw and shade a circle to represent $\frac{4}{4}$.



18. Marsha glanced at the clock while she was eating dinner.

(38)

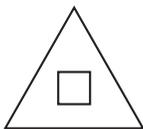
Write the time in digital form.



19. **Multiple Choice** Which figure shows a triangle inside of a square?

(67)

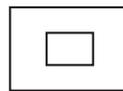
A



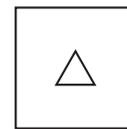
B



C



D



20. **Multiple Choice** Which word best names the shape of the Earth?

(75)

A circle

B sphere

C rectangle

D cylinder

Using Manipulatives to Divide by a One-Digit Number

Power Up

facts

Power Up 85

jump start

- 123 Count up by 11s from 0 to 110.
Count up by square numbers from 1 to 144.
- 🕒 It is 11:50 in the morning. Draw hands on your clock to show the time. Write the time in digital form.
- 🌡 In March the average daily high was 63°F . In January, the average high was 12 degrees cooler. Mark your thermometer to show the average high in January.

mental math

- a. **Number Sense:** $54 + 60$
- b. **Number Sense:** $7 \times 5 \times 10$
- c. **Money:** $\$1.30 + 99\text{¢}$
- d. **Estimation:** Round the value of these bills and coins to the nearest dollar.



problem solving

Tom is thinking of a number that is greater than 20 but less than 30. The sum of the digits is 6. What is Tom's number?

Using objects can help us understand the different meanings of **division**.

Activity

Equal Groups

Place 12 counters or tiles on your desk for problems **1** and **2**.

1. Tony has a collection of 12 rocks. He divided the rocks into 3 equal groups. How many rocks were in each group? (Act out the problem with your counters.)
2. Then Tony arranged the 12 rocks into groups with 3 rocks in each group. How many groups did he make? (Act out the problem with your counters.)

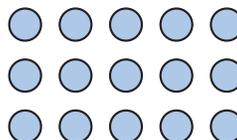
We saw two different meanings of division in the activity. In the first problem we were looking for the **number in each group**. In the second problem we were looking for the **number of groups**. In both problems, we started with one large group and separated it into smaller equal groups.

Connect When we divide, we separate a group into smaller equal groups. How does this relate to multiplication?

Example 1

Fifteen students lined up in 3 rows. How many students were in each row? Use manipulatives or draw a picture to represent the problem. Then show how to write the division.

We arrange 15 counters in 3 equal rows or draw a picture.



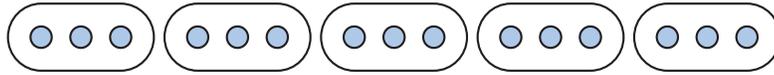
We see that there were **5 students** in each row. We write the division this way:

$$15 \div 3 = 5 \text{ or } \begin{array}{r} 5 \\ 3 \overline{)15} \end{array}$$

Example 2

Fifteen students gathered in small groups of 3 students to work on the problem. How many groups were there? Use manipulatives or a picture to represent the problem. Then show how to write the division.

We separate 15 students into groups of 3.



There are **5 groups** of students. We show the division this way:

$$15 \div 3 = 5 \text{ or } \begin{array}{r} 5 \\ 3 \overline{)15} \end{array}$$

Lesson Practice

Use manipulatives or draw pictures to represent each problem. Then show how to write the division.

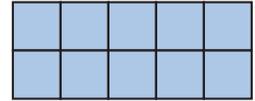
- Eighteen books were stacked in three equal piles. How many books were in each pile?
- Eighteen books were put in stacks with 3 books in each stack. How many stacks of books were there?
- Todd has 20 quarters. He put 4 quarters in each stack. How many stacks did he make?
- Becki cut a 12-inch-long ribbon into 4 equal pieces. How long was each piece of ribbon?

Written Practice

Distributed and Integrated

- (79, 83) The new pencil was 18 cm long. Mark used one half of the pencil. Then how long was the pencil?
- (22) Samantha bought some art supplies for \$17.27 plus \$1.22 sales tax. Write the total price.
- (25, 26) The stamp cost 42¢. Jeremy gave the clerk a dollar bill. What coins should Jeremy get back for change?

4. **Analyze** Darren used 10 tiles to make the rectangle at right. If he doubles the length of the rectangle, then how many tiles will he use in all?



5. Robin and Ashley shared \$14 equally. How much money was there for each girl?

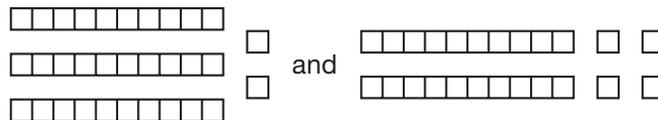
6. **Analyze** Multiply:
- a. $3 \times \$23$
- b. $4 \times \$23$

Model Use counters or draw a diagram to help you solve problems 7 and 8.

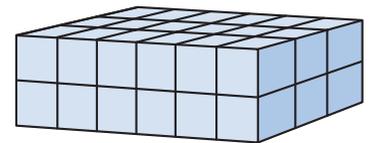
7. Rob put 24 books in 3 equal stacks. How many books were in each stack?

8. Gwen put 24 books into stacks of 6 books. How many stacks were there?

9. Write an addition fact that is shown by the model below.



10. A box is filled with cubes as shown at right.



- a. How many cubes are in each layer?
- b. How many layers are there?
- c. How many cubes are there?
- d. If each cube is 1 cubic inch, what is the volume of all the cubes?

11. Find each missing addend:

a. $15 + m = 25$

b. $n + 12 = 20$

12. Find each product:

a. 9×90

b. 8×80

c. 7×70

Add or subtract, as shown below:

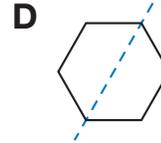
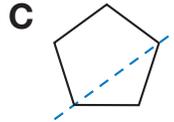
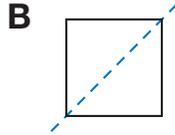
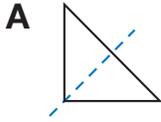
13. $\$786 - \694
(23)

14. $\$3.50 + \$0.97 + \$0.85$
(22, 24)

15. 5×33
(84)

16. $4 \times 4 \times 4$
(77, 84)

17. **Multiple Choice** Which figure does *not* show a line of symmetry?
(Inv. 7)



18. **a.** Draw a square with sides 6 cm long.
(58, 62, 79)

b. What is the perimeter of the square?

c. What is the area of the square?

19. Use the number line below to help you find the next four numbers in this sequence:
(2, 48)

$$2\frac{1}{2}, 2\frac{3}{4}, 3, 3\frac{1}{4}, 3\frac{1}{2}, \dots$$



20. Draw two parallel line segments. Then draw two more parallel line segments that cross the first two segments and are perpendicular to them. What game can you play using this design?
(Inv. 4)

Early Finishers
Real-World Connection

Martina is a carpenter. She has a wooden board that is 182 inches long. She is working on 2 projects. She uses 41 inches for the first project and 64 inches for the second project. How many inches of the board are left for Martina to use?

- Division Facts
- Multiplication and Division Fact Families

Power Up

facts

Power Up 86

jump start

 Count up by 2s from 0 to 30 and then back down to 0. Count up by 5s from 0 to 60 and then back down to 0.



Write two multiplication facts using the numbers 5, 11, and 55.



Draw a 5-centimeter segment on your worksheet. About how many inches long is the segment?

mental math

a. **Calendar:** How many months are in 6 years?

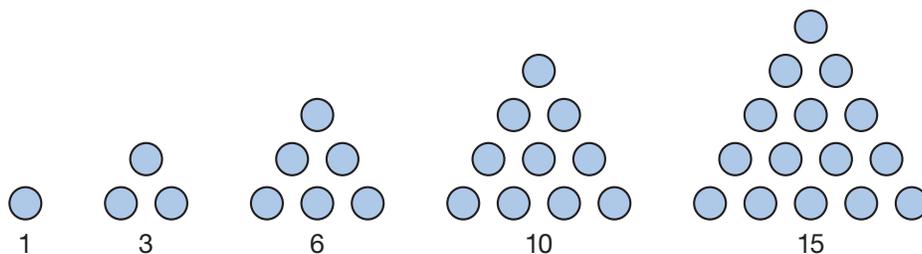
b. **Number Sense:** $84 - 40$

c. **Number Sense:** $77 + 25$

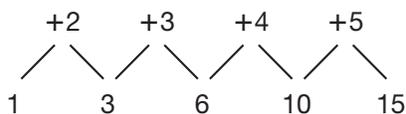
d. **Money:** $\$3.49 + \7.00

problem solving

In the problem solving exercise for Lesson 83, we found that we can use objects to make triangular patterns.



The numbers 1, 3, 6, 10, and 15 are examples of **triangular numbers**. Notice how the numbers increase:



Continue the pattern to find the next two triangular numbers.

New Concepts

Division Facts

We can learn division facts while we are learning multiplication facts. The same three numbers that make a multiplication fact also make a division fact.

$$20 = 4 \times 5$$

$$20 \div 4 = 5$$

When we multiply, we know the two factors, and we are looking for the product. When we divide, we know the product and one of the factors, and we are looking for the other factor. When dividing we call these numbers the **dividend**, **divisor**, and **quotient**.

$$\text{dividend} \div \text{divisor} = \text{quotient} \qquad \text{divisor} \overline{) \text{dividend}} \qquad \text{quotient}$$

Example 1

Find each quotient:

a. $24 \div 6$

b. $4 \overline{)24}$

a. We read $24 \div 6$ as “Twenty-four divided by six.” We may think, “Six times what number equals 24?” Since $6 \times 4 = 24$, the quotient is **4**.

b. We read $4 \overline{)24}$ as “Twenty-four divided by four.” We think, “What number times 4 equals 24?” Since $6 \times 4 = 24$, the quotient is **6**.

Multiplication and Division Fact Families

The three numbers that make a multiplication fact can also be used to make a division fact. Together, the multiplication facts and their related division facts make up a **fact family**.

Fact Family

Multiplication Facts	Division Facts
$4 \times 6 = 24$	$24 \div 6 = 4$
$6 \times 4 = 24$	$24 \div 4 = 6$

Example 2

Write two multiplication facts and two division facts using the numbers 6, 7, and 42.

The product is 42 and the factors are 6 and 7, which can be written in either order.

$$6 \times 7 = 42$$

$$7 \times 6 = 42$$

By dividing 42 by 6 and by 7 we form two division facts.

$$42 \div 6 = 7$$

$$42 \div 7 = 6$$

Example 3

Write two multiplication facts and two division facts shown by this array:



There are 3 rows of 5 stars and 15 stars in all.

$$3 \times 5 = 15$$

$$5 \times 3 = 15$$

$$15 \div 5 = 3$$

$$15 \div 3 = 5$$

Analyze

How many multiplication and division facts can be written to show an array of 3 rows of 3 stars?

Example 4

Find each missing factor.

a. $3 \times \square = 18$

b. $m \times 4 = 36$

To find a missing factor we divide the product by the known factor.

a. Because $18 \div 3 = 6$, we know that $3 \times 6 = 18$.

b. Because $36 \div 4 = 9$, we know that $9 \times 4 = 36$.

Lesson Practice

Find each quotient.

a. $24 \div 3$

b. $3 \overline{)18}$

c. $18 \div 9$

d. $2 \overline{)8}$

e. $30 \div 5$

f. $4 \overline{)20}$

g. Write two multiplication facts and two division facts using the numbers 56, 7, and 8.

- h. Write two multiplication facts and two division facts represented by the array below.



Find each missing factor.

i. $6 \times \square = 42$

j. $n \times 3 = 27$

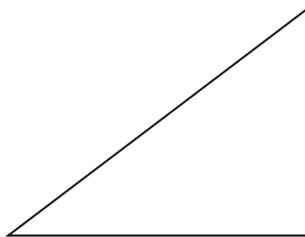
Written Practice

Distributed and Integrated

- (20, 28) Oscar took his family to an amusement park. The fee to enter the park was \$64. Oscar paid the fee with a \$100 bill. How much money should he get back?
- (21, 60) Marcie purchased 10 greeting cards for \$0.35 each. How much did she pay for all 10 cards?
- (32) The odometer of the car showed this display:



- (69, 79) **Model** Use a centimeter ruler to help you answer the following questions about this triangle:



- How long are the three sides of the triangle?
- What is the perimeter of the triangle?

5. a. **Represent** Draw a triangle that is congruent to the triangle in problem 4.
(68, 69)

b. What type of triangle did you draw?

6. What is the total value of ten quarters, ten dimes, ten nickels, and ten pennies?
(25)

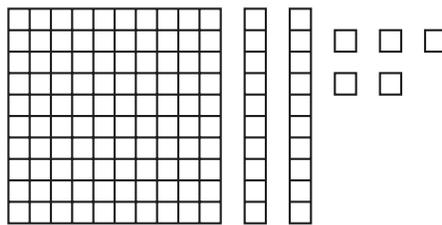
7. Recall that a dozen is 12. How many eggs are equal to half of a dozen?
(83)

8. The bridge had a weight limit of 8 tons. How many pounds is 8 tons?
(74, 78)

9. Write two multiplication facts and two division facts using the numbers 7, 8, and 56.
(86)

10. Choose the best measure. The mass of a raisin is about
(80) 1 gram. 1 kilogram.

11. **Multiple Choice** This picture shows the answer to which subtraction below?
(11, 19)



A $375 - 250$

B $125 - 50$

C $750 - 200$

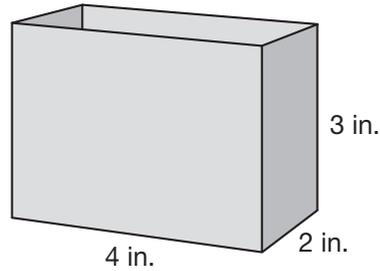
12. Multiply:

(84)

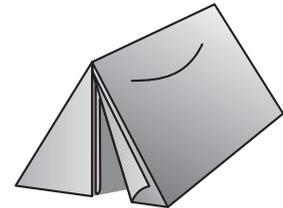
a. 8×42

b. $4 \times 34\text{¢}$

13. **Analyze** (72, 73) A box like the one shown below is completely filled with one-inch cubes.



- a. How many cubes are needed for the bottom layer?
b. How many layers of cubes are needed to fill the box?
c. What is the volume of the box?
14. Find each product:
(78) a. 6×90 b. 4×80 c. 3×60
15. $\$300 - \166 16. $\$3.75 + \2.87
(28) (22)
17. $8 \times 9 \times 10$
(77)
18. Find the missing factor: $6 \times n = 42$
(86)
19. Write "four and three fourths" using digits.
(46)
20. **Multiple Choice** (75) Which choice below best describes the shape of a tent like the one shown at right?
- A pyramid B rectangular prism
C cone D triangular prism



• Capacity

Power Up

facts

Power Up 87

jump
start

- Count down by 6s from 60 to 0.
Count down by 12s from 120 to 0.



Write two division facts using the numbers 3, 5, and 15.



Draw a rectangle and divide it into 8 parts. Then shade 3 parts. What fraction is not shaded?

mental
math

- a. **Money:** $\$2.60 + 99\text{¢}$
 b. **Number Sense:** $88 - 19$
 c. **Number Sense:** $7 \times 3 \times 10$
 d. **Algebra:** Jared made this table to show the number of pages he had read. Find the missing number in the table.

Pages read	10	20	30	40	50
Minutes	5	10	_____	20	25

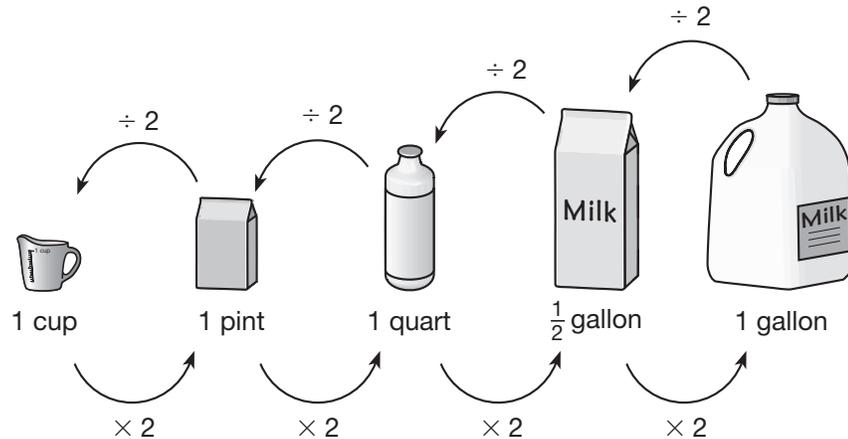
problem
solving

Perry's school starts classes at half past eight in the morning. If it takes Perry 1 hour to get to school, at what time does Perry need to leave home?

New Concept

The amount of liquid a container can hold is called its capacity. To measure capacity in the Customary System, we use the units **ounces**, **cups**, **pints**, **quarts**, and **gallons**. Some of these units have a doubles and halves relationship. On the following page we show some common containers.

Discuss How does the picture below show a doubles relationship? How does it show a halves relationship?



Activity

Measuring Capacity

Materials: measuring cup, one-pint bottle, one-quart bottle, half-gallon container, one-gallon container, water or rice

Do this activity in a small group or as a class.

1. Fill a measuring cup to the one-cup level and pour the contents into a one-pint bottle. Repeat until the bottle is full. How many cups were needed?
2. Empty the full one-pint bottle into the one-quart bottle. Repeat until the one-quart bottle is full. What is another name for half a quart?
3. Fill the half-gallon container from the one-quart bottle. What is another name for two quarts?
4. Then fill the one gallon container from the half-gallon container. How many quarts does it take to make a gallon?

Connect The word “quart” is in the word “quarter.” In what way is a quart of water like a quarter of a dollar?

Analyze Doctors advise us to drink eight cups of water each day. What size liquid container equals eight cups?

Example 1

Multiple Choice Willow poured milk into her bowl of cereal. About how much milk did she pour?

- A 1 cup B 1 quart C 1 gallon

For a bowl of cereal, Willow would use about **one cup**, which is choice **A**.

Example 2

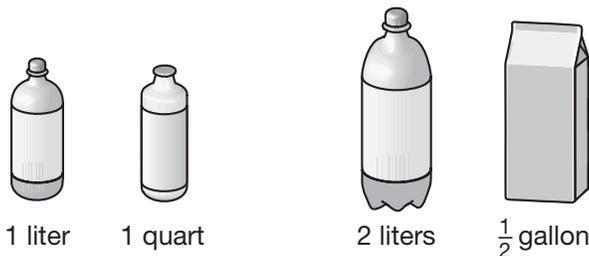
A cup is 8 ounces. How many ounces is a pint?

Two cups equal a pint; so a pint has twice as many ounces as a cup.

$$2 \times 8 \text{ ounces} = 16 \text{ ounces}$$

A pint is **16 ounces**.

A **liter** is used to measure capacity in the metric system. A liter is a little more than a quart.



Example 3

Which is more, 2 liters of a beverage or $\frac{1}{2}$ gallon of a beverage?

Two quarts equal $\frac{1}{2}$ gallon. A liter is a little more than a quart; so 2 liters is close to, but **a little more than, $\frac{1}{2}$ gallon**.

Lesson Practice

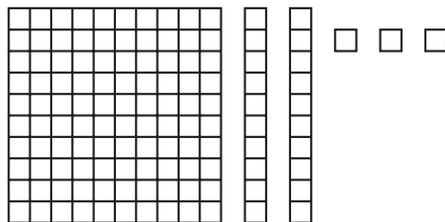
- A gallon of milk is how many quarts?
- A pint is 16 ounces. How many ounces is a quart?
- Multiple Choice** Which unit would describe the amount of juice in a container?
A quart B foot
C pound D meter

- d. **Multiple Choice** Todd drank a glass of juice. Which measure below best describes the amount of juice in a glass?
A 10 ounces **B** 10 cups **C** 10 pints **D** 10 quarts

Written Practice

Distributed and Integrated

- Analyze** Gabriel filled the ice tray with water from the tap and then put the ice tray in the freezer. If water from the tap is 62°F , how many degrees does it need to cool until it starts to freeze?
(4, 20)
- Joey and Jermaine shared 18 pretzels equally. How many pretzels did each boy get? Draw a picture to represent the problem.
(82)
- Conclude** Jayne rode her bike one mile on Monday, two miles on Tuesday, and four miles on Wednesday. Each day she rode twice as far as she rode the day before. How many miles did she ride on Saturday?
(81)
- How many months is half of a year?
(83)
- Steve paid two dollars for a toy that cost $\$1.39$. What coins should he get back in change?
(25, 26)
- Arrange these units in order of size from shortest to longest:
(79)
meter kilometer centimeter
- What fraction of a gallon is equal to a quart?
(44, 87)
- Multiple Choice** This picture shows the answer to which multiplication below?
(11, 84)



- A** 3×21 **B** 4×31 **C** 3×41 **D** 12×3

9. Multiply:

(84)

a. 6×34

b. $3 \times 46\text{¢}$

10. **Multiple Choice** What is a reasonable estimate of the amount of water in a full pitcher?
(87)

A 2 ounces

B 2 quarts

C 2 gallons

D 2 cups



11. **Multiple Choice** A liter is closest in measure to a
(87)

A pint.

B quart.

C half-gallon.

D gallon.

12. Find the missing factor: $7 \times m = 28$.

(86)

13. Look at the sequence below. Each number is twice as big as the number before it. Find the next three numbers in the sequence.
(81)

1, 2, 4, 8, 16, _____, _____, _____, ...

14. $\$8.96 + \4.78

(22)

15. $\$11.00 - \5.75

(26, 28)

16. $5 \times 5 \times 5$

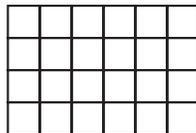
(77, 84)

17. $6 \overline{)42}$

(86)

18. Write two multiplication facts and two division facts using the numbers 6, 7, and 42.
(86)

19. A rectangle was formed with tiles that were 1-foot squares.
(58, 62)



a. How long is the rectangle?

b. How wide is the rectangle?

c. What is the area of the rectangle?

d. What is the perimeter of the rectangle?

20. This paper clip is how many centimeters long?

(79)



• Even and Odd Numbers

Power Up

facts

Power Up 88

jump start

-  Count up by 8s from 0 to 88.
Count up by 4s from 0 to 44.



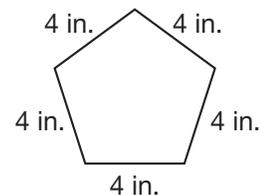
Draw a rectangle that is 3 centimeters long and 3 centimeters wide.



Write the largest 4-digit number that uses each of the digits 1, 7, 8, and 5. What is the value of the digit in the thousands place?

mental math

- Number Sense:** $4 \times 4 \times 10$
- Number Sense:** $96 - 30$
- Number Sense:** 2, 7, 3, 8, 4, 9, _____
- Measurement:** What is the perimeter of the pentagon?



problem solving

Focus Strategy: Work a Simpler Problem

What day of the week is 71 days after Monday?

Understand We are asked to find which day of the week is 71 days after Monday.

Plan Instead of counting each of the 71 days, we can work a simpler problem.

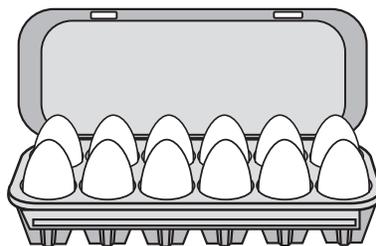
Solve One week after Monday is Monday. Two weeks after Monday is also Monday. Each week is 7 days, so we can count up by 7s to reach 70, which is close to 71.

We know that 70 days after Monday is Monday. This means that 71 days after Monday is the next day, which is **Tuesday**.

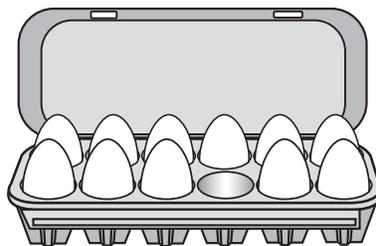
Check Our answer is reasonable because 70 days is 10 weeks ($10 \times 7 \text{ days} = 70 \text{ days}$). Ten weeks after Monday is Monday, so 10 weeks plus 1 day is Tuesday.

New Concept

If we can divide a number of objects into two equal groups, then the number is **even**. We see that 12 is an even number because 12 objects can be divided into two equal groups.



If a number of objects does not divide into two equal groups, the number is **odd**. So 11 is an odd number because it does not divide into two equal groups.



Activity

Even and Odd Numbers

Materials: counters

1. Place 10 counters on your desk. Can you divide 10 counters into two equal groups? Is 10 an even number or an odd number?
2. Place 9 counters on your desk. Can you divide 9 counters into two equal groups? Is 9 an even number or an odd number?

3. Place 8 counters on your desk. Divide the counters. Is 8 even or odd?
4. Place 7 counters on your desk. Is 7 even or odd? How do you know?

Example 1

Are the numbers we say when we count by twos even numbers or odd numbers?

2, 4, 6, 8, 10, ...

Each of these numbers can be divided into two equal groups. When we count by twos from 2, we say **even numbers**.



The numbers 1, 3, 5, 7, 9... are odd numbers. They cannot be divided into two equal groups.

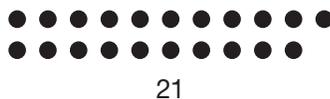


Generalize You can name every whole number as either even or odd. What is the rule for the pattern of even/odd numbers in the sequence 1, 2, 3, 4, 5, 6, 7, 8, 9, ...?

Example 2

There are 21 students in the class. Can all the students line up into two equal rows?

The students can line up into two equal rows only if the number of students is even. Twenty-one is not an even number. It is an odd number.



No, 21 students cannot line up into two equal rows.

A quick way to tell if a counting number is even or odd is to look at the last digit of the number. If the last digit is even (0, 2, 4, 6, 8), then the number is even. If the last digit is odd (1, 3, 5, 7, 9), then the number is odd.

Example 3

There are 365 days in a common year. Is 365 even or odd?

The last digit of 365 is 5, which is odd. So 365 is **odd**.

Lesson Practice

- a. **Multiple Choice** Which of these numbers is even?
A 3 B 13 C 23 D 32
- b. Can 28 students line up into two equal rows? Explain your answer.
- c. Simon has \$7. Nathan has \$7. If they put their money together, will they have an even number of dollars or an odd number of dollars?
- d. **Multiple Choice** Which of these months has an even number of days?
A July B August
C September D October

Written Practice

Distributed and Integrated

1. (22, 60) Ramon bought a half gallon of milk for \$2.24, a loaf of bread for \$1.89, and a can of juice for \$1.18. What was the total price of these groceries?
2. (20, 28) Ramon paid for the groceries in problem 1 with a \$10 bill. How much money should he get back?
3. (32) From the Earth to the moon is about two hundred fifty thousand miles. Use digits to write that number.
4. (83) How many inches are equal to half of a foot?
5. (42, 46) Draw a picture to represent $2\frac{1}{2}$.
6. (81) Double each number:
a. 100 b. 30

7. Find half of each number:

(83)

a. 10

b. 30

8. **Multiple Choice** Which of the following numbers is an even number?

(88)

A 365

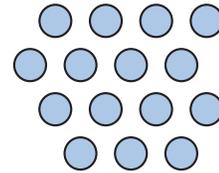
B 536

C 563

D 635

9. **Explain** Can John separate 15 counters into 2 equal groups? Explain your answer.

(88)



10. Find each product.

(78, 84)

a. 5×30

b. $4 \times \$24$

11. a. How many pints are equal to a quart?

(87)

b. What fraction of a quart is a pint?

12. Find each quotient.

(86)

a. $8 \overline{)48}$

b. $36 \div 4$

13. Write 521,769 in expanded form.

(32)

14. **Conclude** In the sequence below each number is half as big as the number before it. Find the next three numbers in the sequence.

(83)

64, 32, 16, _____, _____, _____, ...

15. $\$496 + \467

(16)

16. $\$10.00 - \9.48

(26, 28)

17. $4 \times 5 \times 6$

(77, 78)

18. 3×36

(84)

19. Find the missing factor: $9 \times n = 72$

(86)

20. **Model** Use a centimeter ruler to help you answer the following questions about this rectangle.

(58, 62)

a. What is the length of the rectangle?

b. What is the width of the rectangle?

c. What is the perimeter of the rectangle?

d. What is the area of the rectangle?



Using a Multiplication Table to Divide By a One-Digit Number

Power Up

facts

Power Up 89

jump start

- 1**₂₃ Count up by odd numbers from 1 to 25.
Count up by even numbers from 2 to 30.



Write two division facts using the numbers 4, 6, and 24.



Draw a 13-centimeter segment on your worksheet.
About how many inches long is the segment?

mental math

- Time:** What is the time 3 hours after 3:47 a.m.?
- Measurement:** How many inches are in 7 feet?
- Money:** $\$5.15 + \0.99
- Money:** Find the value of these bills and coins:



problem solving

Tristan's baby brother turned 13 months old in February.
In what month was Tristan's brother born?

New Concept

In Lesson 83 we used a multiplication table to divide by 2. In this lesson we will use a multiplication table to divide by other numbers. Read the following problem.

For an art project, 24 students will sit at 6 tables. If the students are divided equally, how many students will sit at each table?

To answer the question, we divide 24 into 6 equal groups. To divide 24 by 6, we will use a multiplication table. We look in the 6 row for 24. At the top of the column, we see 4. This means $24 \div 6 = 4$. So, there are 4 students at each table.

Represent Draw a picture to show the solution to the problem above.

Multiplication Table

	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Example 1

For Game Day the teacher divided the 32 students into 4 equal teams. How many students were on each team?

To find the answer to $4 \overline{)32}$ on the table, we find 32 in the 4 row. Then we look at the top of the column and see 8. There were **8 students** on each team.

Example 2

The farmer planted an array of 42 trees in the orchard with 6 trees in each row. How many rows of trees did the farmer plant?

To find the quotient of $42 \div 6$, we look in the 6 row for 42. We see 7 at the top of that column. The farmer planted **7 rows** of trees.

Lesson Practice

- There are 12 inches in a foot. How many feet is 60 inches?
- Derek placed 32 books in 4 equal stacks. How many books were in each stack?

Use a multiplication table to find each quotient.

c. $56 \div 8$

d. $84 \div 7$

e. $9 \overline{)72}$

f. $6 \overline{)54}$

Written Practice

Distributed and Integrated

- An eraser costs 32¢. How much would five erasers cost?
(60)
- The record was 900 points. Jan had 625 points. How many more points did Jan need to reach the record?
(28, 36)
- Analyze** Half a dozen children were playing in the yard. Then half of them left. How many children were still in the yard?
(83)
- How many centimeters is half of a meter?
(79, 83)
- Analyze** One way to mentally multiply by 4 is by “double doubling” the other factor. That means to double the other factor, then double the result.
(78, 84)
 - 4×20
 - 4×21
- Multiply:
(84)
 - $6 \times \$14$
 - $7 \times 14¢$

7. **Multiple Choice** Which of the following coins has a value that is an even number of cents?

(88)

- A penny B nickel C dime D quarter

8. **Analyze** If a full gallon container of water is used to fill a half-gallon container and a quart container, then how much water is left in the gallon container?

(87)

9. Write two multiplication facts and two division facts using the numbers 3, 9, and 27.

(86)

10. What number goes in the square to complete the multiplication fact?

(86)

$$\begin{array}{r} \square \\ \times 9 \\ \hline 54 \end{array}$$

11. **Multiple Choice** Which unit is best for measuring the mass of a barbell?

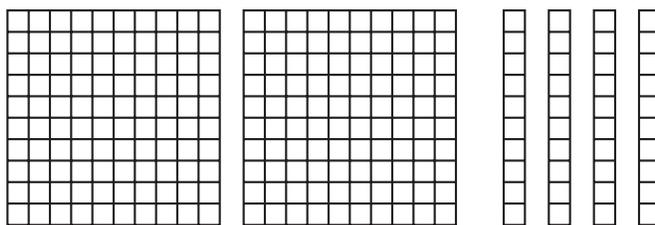
(80)



- A kilograms B feet C meters D ounces

12. **Multiple Choice** This picture shows the answer to which multiplication?

(11, 84)



- A 12×2 B 10×24 C 4×51 D 20×4

13. The shirt was on sale for half price. If the regular price was \$24, what was the sale price?

(83)

14. **Conclude** Find the next three numbers in this doubling sequence:

(81)

5, 10, 20, _____, _____, _____, ...

15. Find each quotient:

(86)

a. $24 \div 4$

b. $24 \div 6$

c. $24 \div 8$

16. $\$1 - 42\text{¢}$

(21, 28)

17. $38 + 47 + 163 + 9$

(24)

18. $\$63 - \45

(23)

19. $4 \times 3 \times 10$

(77)

20. **Multiple Choice** Which multiplication or division fact below is *not* illustrated by this diagram?

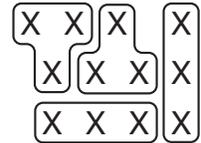
(85, 86)

A $12 \div 4 = 3$

B $4 \times 3 = 12$

C $12 \div 3 = 4$

D $2 \times 12 = 24$



Early Finishers

Real-World Connection

Roderick's baby sister drinks 3 cups of milk a day. How many cups of milk does his baby sister drink in a week? How many cups of milk would she drink in the month of April?

• Equal Groups Problems, Part 2

Power Up

facts

Power Up 90

jump start

-  Count up by 3s from 0 to 45.
Count up by 9s from 0 to 99.



Draw a hexagon in the workspace on your worksheet.

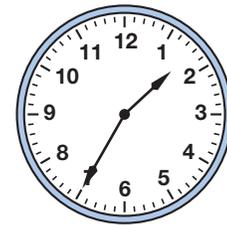


Use these clues to find the secret number. Write the secret number on your worksheet.

- two-digit number
- sum of digits is 9
- product of the digits is 20
- odd number

mental math

- a. **Number Sense:** $17 + 16$
- b. **Number Sense:** 5×40
- c. **Geometry:** How many sides do 3 hexagons have?
- d. **Time:** It is afternoon. Keyanna's little sister took a nap at the time shown on the clock. She woke up 1 hour later. What time did she wake up?



problem solving

The school principal's office has a water cooler. The big bottle of water that sits on top of the cooler is labeled "5 gallons." Cheyenne is making a table to help her find how many cups of water are in 5 gallons. Copy this table and fill in the missing numbers. How many cups are in 5 gallons?

Gallons	Cups
1	16
2	
3	
4	
5	

New Concept

Recall that an equal-groups story has three numbers.

If we know the number of groups and the number in each group, then we multiply to find the total.

$$\text{Number of groups} \times \text{Number in each group} = \text{Total}$$

If we know the total and want to know the number of groups or the number in each group, we divide to find the answer.

$$\text{Total} \div \text{Number of groups} = \text{Number in each group}$$

$$\text{Total} \div \text{Number in each group} = \text{Number of groups}$$

Example 1

Twenty-eight children are going on a field trip. Seven cars are available to drive the children. If the children are divided into equal groups, how many children will ride in each car?

See how this story fits the equal groups pattern.

$$\text{Number of groups} \times \text{Number in each group} = \text{Total}$$

$$7 \text{ cars} \quad \times \quad ? \text{ in each car} \quad = \quad 28 \text{ children in all}$$

This story has a missing factor.

$$7 \times ? = 28$$

We can find a missing factor by dividing.

$$28 \div 4 = 7$$

We answer the question. **Four children** will ride in each car.

Example 2

Twenty-four people are coming to a party. They will sit at tables that will seat four people. How many tables will be needed to seat them all?

We see that the story fits the equal groups pattern.

$$\text{Number of groups} \times \text{Number in each group} = \text{Total}$$

$$? \text{ tables} \quad \times \quad 4 \text{ people at each table} \quad = \quad 24 \text{ people in all}$$

We know the total and the number in each group, but we do not know the number of groups.

$$? \times 4 = 24$$

We divide to find the missing factor.

$$\begin{array}{r} 6 \\ 4 \overline{)24} \end{array}$$

We find that **6 tables** are needed.

Represent Draw a picture to show the equal groups story in example 2.

Lesson Practice

- a. Sylvester has 40 pennies. He puts them in stacks with 5 pennies in each stack. How many stacks does he make?
- b. There are 30 desks in the room. The teacher wants to arrange the desks in 6 equal rows. How many desks will be in each row?

Written Practice

Distributed and Integrated

1. ⁽³⁴⁾ Simon took twelve big steps to cross the street. Each step is about 1 yard long. The street is about how many feet wide?
2. ⁽²⁰⁾ The television was on sale for \$70 off the regular price. The regular price was \$365. What was the sale price?
3. ⁽³²⁾ The population of the town is 16,000. Write the number using words.
4. ⁽¹⁵⁾
 - a. Round \$389 to the nearest hundred dollars.
 - b. Round \$315 to the nearest hundred dollars.
5. ⁽³⁰⁾ Dixon bought a table for \$389 and a chair for \$315. Estimate the total cost of the desk and chair.

6. ⁽⁸³⁾ On Monday, Max finished the fact practice quiz in 80 seconds. On Wednesday, he finished in half that time. In how many seconds did Max finish the quiz on Wednesday?

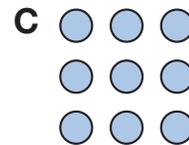
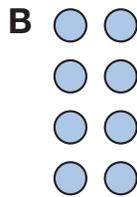
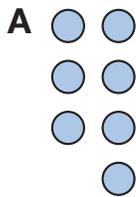
7. ^(78, 84) **Analyze** Mentally multiply by 4 by “double doubling” the other factor.

a. 4×30

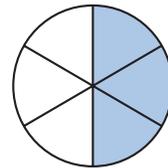
b. 4×15

8. ⁽⁹⁰⁾ Thirty desks were arranged in rows with 5 desks in each row. How many rows of desks were there?

9. ⁽⁸⁸⁾ **Multiple Choice** Which illustration below shows an even number of counters?



10. a. ^(42, 47) The shaded circle shows what fraction equivalent to $\frac{1}{2}$?



b. **Represent** Draw and shade a circle to show a fraction equivalent to $\frac{1}{2}$ that has a denominator of 4. What is the fraction?

11. Multiply:

⁽⁸⁴⁾

a. $6 \times \$25$

b. $7 \times 15\text{¢}$

12. Find the missing number: $48 - w = 29$.

⁽⁴⁰⁾

13. ⁽⁸³⁾ **Conclude** In this sequence each number is half the number before it. Find the next three numbers in this sequence.

160, 80, 40, _____, _____, _____, ...

14. Find each quotient:

⁽⁸⁵⁾

a. $25 \div 5$

b. $21 \div 3$

c. $20 \div 4$

15. $5 \times 6 \times 7$

⁽⁷⁷⁾

16. $\$5.00 - \2.34

^(26, 28)

17. Find each product:
(56, 78)

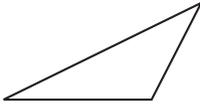
a. 4×90

b. 7×90

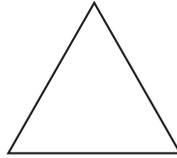
c. 10×23

18. **Multiple Choice** Which polygon below does *not* have at least one obtuse angle?
(65, 67)

A



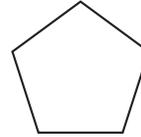
B



C

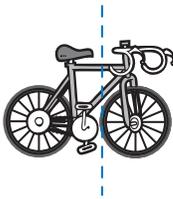


D



19. **Multiple Choice** Which figure shows a line of symmetry?
(Inv. 7)

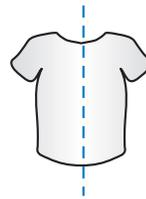
A



B



C



D



20. **Represent** Sketch a map that shows your school and your home. Make the top of the map north. Then write directions to your home from school.
(31)

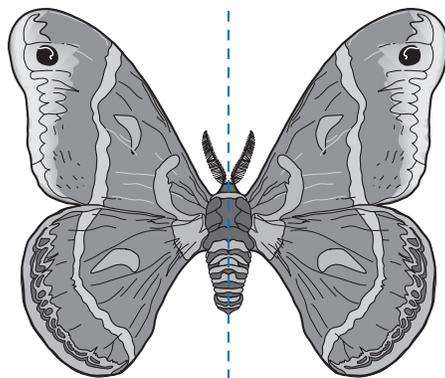
Early Finishers
Real-World Connection

Rosemary was making a costume. She sewed five buttons on her costume. The red button was below the blue one. The green button was above the blue one. The yellow button was between the blue and red ones. The purple button was above the green one. Which button is in the middle? Draw a picture to show your answer.

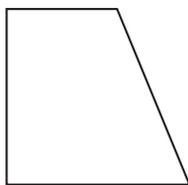
Focus on

• Symmetry, Part 2

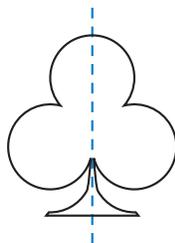
Recall from Investigation 7 that a line of symmetry divides a figure into mirror images.



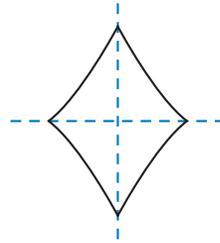
A figure may have one line of symmetry, two lines of symmetry, or more. A figure may also have no lines of symmetry.



No lines of symmetry



One line of symmetry



Two lines of symmetry

A line of symmetry also shows where a figure could be folded in half so that one half exactly fits onto the other half. In the following activity, you will create shapes with one or two lines of symmetry by folding and cutting paper.



Activity 1

Creating Symmetrical Figures

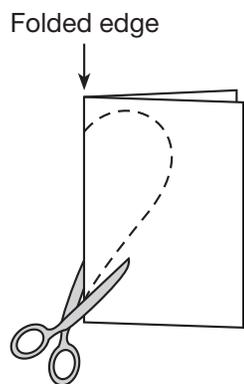
Materials: two sheets of paper, scissors

Fold a sheet of paper in half. While the paper is folded, cut a shape out of the paper starting from one end of the folded edge to the other end.

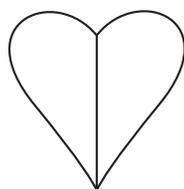


Visit www.SaxonMath.com/Int3Activities for an online activity.

Here we show a heart shape being cut from the folded paper:

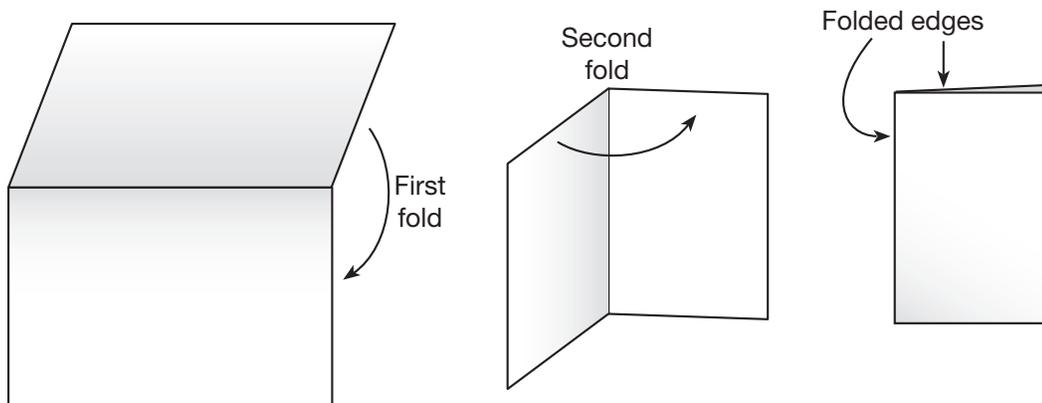


The opened figure you cut out has a line of symmetry along the fold.

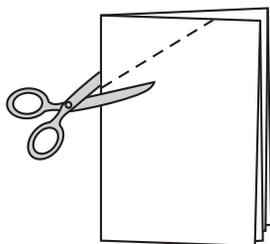


Fold is line of symmetry

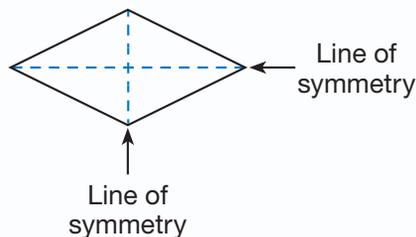
Repeat the activity with another sheet of paper folded twice.



Cut a shape from the twice-folded paper, beginning the cut from one folded edge and ending in the other folded edge.

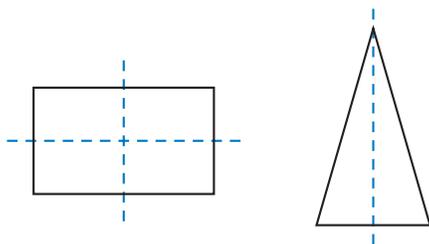


The opened figure you cut out has two lines of symmetry along the folds.



Recall from Investigation 7 that when we place an upright mirror on a line of symmetry, the reflection in the mirror completes the figure.

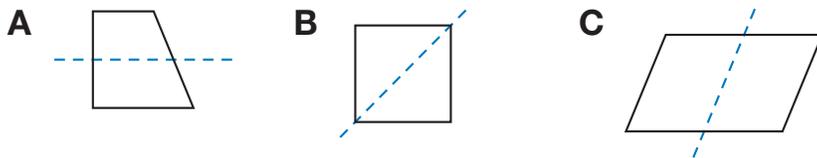
Place a mirror on the lines of symmetry in these figures to see the complete shape in the reflection.



1. **Multiple Choice** Use a mirror to decide which of these letters has a line of symmetry.



2. **Multiple Choice** Which of these quadrilaterals shows a line of symmetry?



Activity 2

Lines of Symmetry

Materials: **Lesson Activity 30**, ruler, pencil

On **Lesson Activity 30**, there are four polygons. Three of the polygons have lines of symmetry. Draw at least one line of symmetry across each of those three polygons.