Hurray Array!

You can demonstrate multiplication by showing objects in an array. There are two ways to set up an array with two factors.

For each array given, create a different array that shows the same factors. Then write the multiplication sentence for each picture.

1. ○ ○ ○ ○ ○ ○
    ○ ○ ○ ○ ○ ○
    ○ ○ ○ ○ ○ ○   =
    ○ ○ ○ ○ ○ ○

    _____

    _____

2. ☐ ☐ ☐ ☐ ☐ ☐
    ☐ ☐ ☐ ☐ ☐ ☐   =
    ☐ ☐ ☐ ☐ ☐ ☐

    _____

    _____

There are at least two arrays for any product: the product × 1 and 1 × the product. Sometimes there are other possible arrays for a product.

3. Draw the other array for the product 25.
    Write the multiplication sentence.

    _____

4. Draw the other array for the product 9.
    Write the multiplication sentence.

    _____

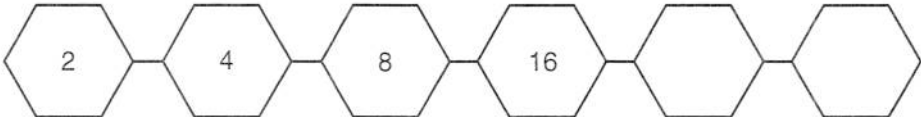Sometimes there are several different arrays that can be drawn for a product.

5. Draw an array for the product 28 that is not 28 × 1, 1 × 28, 7 × 4, or 4 × 7. Write the multiplication sentence for your array.
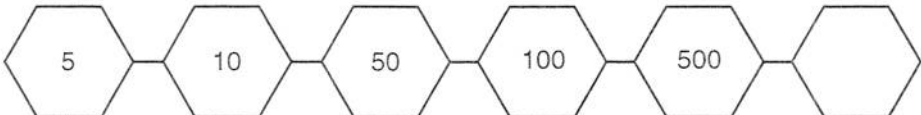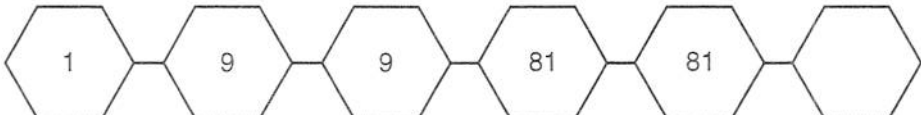
    _____

Patterns, Patterns Everywhere

Complete each pattern and write the rule for the pattern you find. Hint: The pattern may involve more than one operation. For example, the numbers 2, 4, 16, 32, 128 form a pattern of multiplying by 2, then multiplying by 4.

Pattern Rule

1. 2   4   8   16   _____

2. 5   10   50   100   500   _____

3. 1   9   9   81   81   _____

4. 7   0   0   0   _____

5. 5   5   25   25   125   _____

6. 1   1   2   6   24   _____

7. Although a single starfish may have as many as 44 arms, we are most familiar with starfish that have 5 arms. Write a number pattern for 6 starfish if each had 5 arms. How many arms would those starfish have in all?
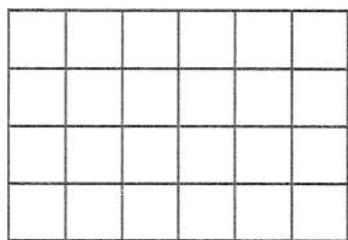
_____

_____

Name_____

How Does Your Garden Grow?

Area is the name for the number of square units that are in a given space. You can figure out the area of a rectangle as you would an array. You can also break apart a rectangle to form different combinations and still have the same area.
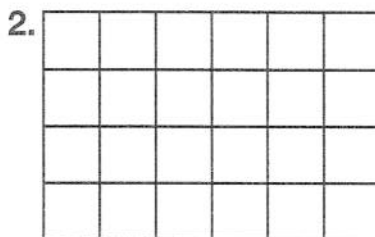
Here is Mary's garden: $4 \times 6 = 24$ square units.

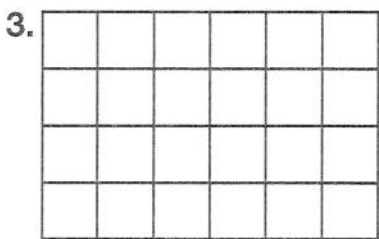Draw lines and write the first letter of the flower to show several possible planting plans.

1.
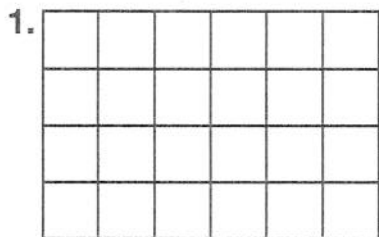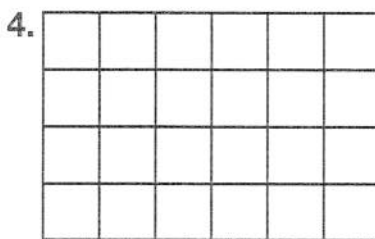
$2 \times 6 = $ tulips
$2 \times 4 = $ roses
$2 \times 2 = $ marigolds

2.

$4 \times 4 = $ tulips
$2 \times 2 = $ roses
$2 \times 2 = $ marigolds

3.

$3 \times 4 = $ tulips
$1 \times 6 = $ roses
$3 \times 2 = $ marigolds

4.

$4 \times 5 = $ tulips
$1 \times 3 = $ roses
$1 \times 1 = $ marigolds

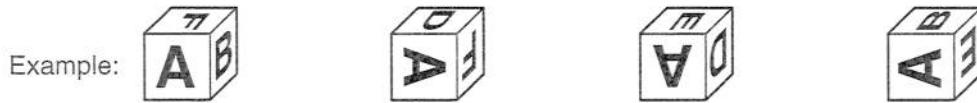# Cube Turning

A lettered cube has 6 sides with a different letter on each side.
Each letter can be shown in 4 different positions.

1. How many different ways can the cube be displayed?

Fill in the missing letters in the position they would be seen on
the cube. The first one has been done for you as an example.

Example:

2.

3.

4.

5.

6.

Name_____

Recycling Numbers

Miles and Cynthia participated in a weeklong recycling project.
Cynthia collected 4 cans every day, and Miles collected 3 cans
every day.

1. Fill in the table to show how many cans each student has
   collected by the end of each day.

Days	1	2	3	4	5	6	7
Miles	3	6					
Cynthia	4	8					

2. At the end of the week, how many cans did Cynthia collect?

_____

3. At the end of the week, how many cans did Miles collect?

_____

4. If the pattern had continued for another week, a total of
   14 days, how many cans would Cynthia have collected?
   How many would Miles have collected?

_____

5. The project was such a success, it was continued for 30
   days. Complete the bar graph to compare the total cans
   collected by Miles and Cynthia.

Cans Collected After 30 Days

Cynthia

Miles

0   20   40   60   80   100   120   140
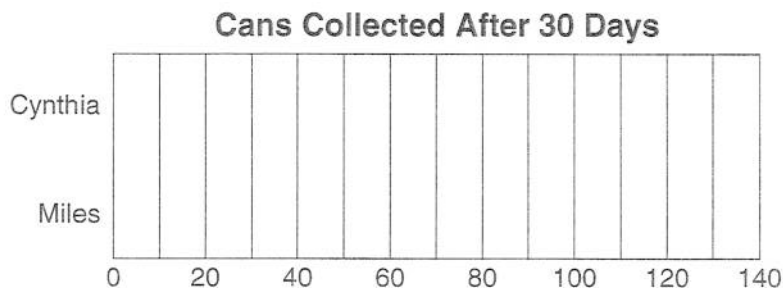
Name_____

Baby-Sitting in the Neighborhood

Jennifer baby-sits for some of the families in her neighborhood. She wants to decide how she can earn the most money. She has made a chart that shows how long she usually baby-sits for a family and how much she is paid for her job.

Family	Hours	Amount Paid
Roberts	6	$30
Robinsons	6	$24
San Giacomos	8	$40
Lings	5	$35
Oberlins	7	$42

1. Which family pays the most per hour? What is the hourly rate?

_____

2. Which family pays the least per hour?

_____

3. Which would pay more, 8 hr of baby-sitting for the Oberlins or 7 hr of baby-sitting for the San Giacomos?

_____

_____

4. On one Friday night, Jennifer is asked to baby-sit for two different families. The Robinsons need her for 5 hr, and the Lings want her to baby-sit for 4 hr. If Jennifer can only take one job and wants to make the most money, which job should she take? How much will she earn?

_____

5. On a different Friday night, the Roberts offer Jennifer a 5-hour baby-sitting job with a $4 tip, and the Robinsons offer Jennifer an 8-hour baby-sitting job. Which job should Jennifer take? How much more will she earn?

_____

© Pearson Education, Inc. 4

Just the Fact(or)s

Some numbers have several factors. Complete the following
to find all of the factors of 12. The first one is done for you.

1. □□□□□□□□□□□□ ÷ ⬭ = 12 in a group
   12
   1 group

2. □□□□□□□□□□□□ ÷ ⬭ = 6 in a group
   12
   ⬭
   2 groups

3. □□□□□□□□□□□□ ÷ ⬭ = ___ in a group
   12
   ⬭
   ⬭
   ⬭
   4 groups

4. □□□□□□□□□□□□ ÷ ⬭ = 4 _____
   12
   ⬭
   ⬭
   _____ groups

5. There are 6 numbers that are factors of 12. What are they?

   _____

Name_____

Divide and Conquer

Find the unknown value in the multiplication fact to help you complete the division fact. Write out both completed facts.

1. $6 \times m = 36$ $\quad \frac{36}{6} = m$

_____

2. $4 \times y = 28$ $\quad \frac{28}{y} = 4$

_____

3. $z \times 8 = 16$ $\quad \frac{16}{8} = z$

_____

4. $7 \times 8 = q$ $\quad \frac{q}{8} = 7$

_____

5. $9 \times r = 54$ $\quad \frac{54}{r} = 9$

_____

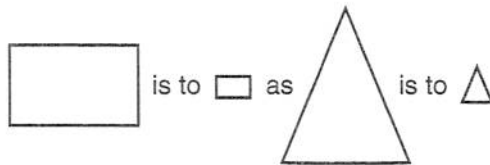**6.** $10 \times s = 10$ $\quad \frac{10}{10} = s$

_____

7. In a soccer match, each team has 11 players. If 24 people are willing to play a game of soccer, are there enough players for two full teams? Write a multiplication and division sentence to show your answer.
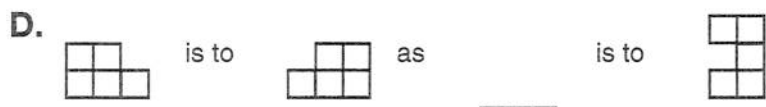
_____

_____

_____

Name_____

Analyze This

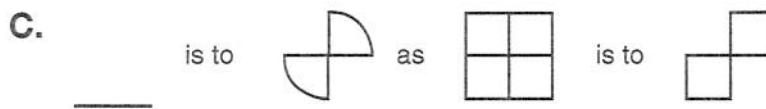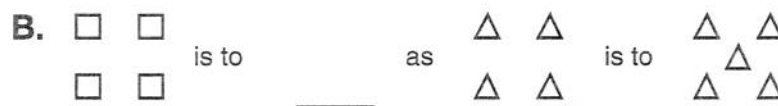An analogy is often used to show the relationship between pairs of items.

□ is to □ as △ is to △

1. How are the drawings of the rectangles related?

_____

_____

2. How are the drawings of the triangles related?

_____

_____

3. Draw the missing item in the following analogies.

A. (circle of circles) is to ○ as (square of squares) is to _____

B. □ □ / □ □ is to _____ as △ △ / △ △ is to △ △ / △ △ △

C. _____ is to (circle figure) as (four-square grid) is to (L-shape squares)

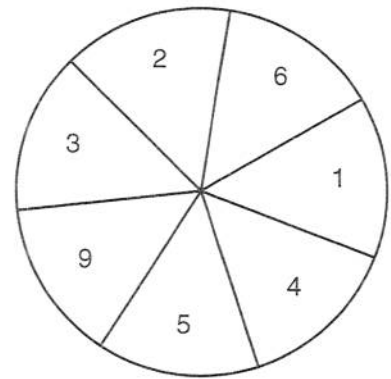D. (square grid figure) is to (square grid figure) as _____ is to (square grid figure)

Name_____

Score More

Use the drawings to help you answer the questions.

1. You threw 3 darts. Each one hit the target.
   What is the greatest score you could get?
   What is the lowest?

   _____

Write number sentences that show your answer.

2. You threw 4 darts and your total was 23.
   What sections did you hit?

   _____

3. Could you hit another combination of 4 darts and score 23?

   _____

4. Could a challenger throw 4 darts, hit only one 9 and score
   higher than you?

   _____

5. You pushed 4 disks and scored 32
   points on this shuffleboard court. One
   disk was out of bounds. On which parts
   of the board did your disks land?
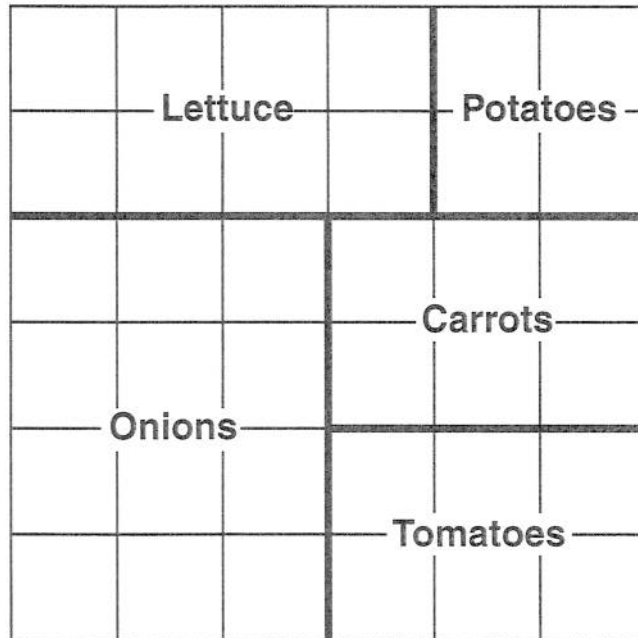
   _____

   _____
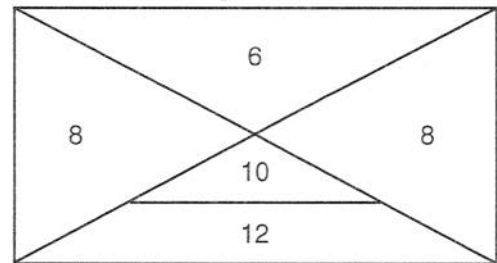
6. If you pushed 4 disks and all of them landed, show two
   ways you could score 34 points.

   _____

   _____

Name_____

Graphing Sales

Fran grows vegetables in her garden, and then she sells them at the market. A diagram of Fran's vegetable patch and a price list for her vegetables are shown below.

Fran's Fresh Produce		
Carrots	2 lb	$1
Onions	3 lb	$2
Tomatoes	3 lb	$5
Potatoes	2 lb	$3
Lettuce	1 lb	$2

Lettuce — Potatoes

Carrots

Onions

Tomatoes

1. How many squares are in Fran's garden?

_____

2. Each square in Fran's garden yields 2 lb of vegetables. If Fran plants every square in her garden, how many pounds of vegetables will she be able to grow?

_____

**3.** Fran makes $18 selling onions at the market. How many pounds of onions did she sell?

_____

4. A customer buys 6 lb of tomatoes, 4 lb of potatoes, and 4 lb of carrots. He pays with a $50 bill. How much change should he get back?

_____

Name_____

Very Variable

1. A $1 bill represents 100 cents. The value of a dollar could also be represented by dimes. Divide the picture of the dollar to represent dimes. Complete the expression for the number of dimes in 100 cents where d = the value of a dime.

$$\frac{100}{d} = \underline{\hspace{1cm}} \text{ dimes}$$

$$\$1$$

$$d$$

$$d = \$0.\underline{\hspace{1cm}}$$
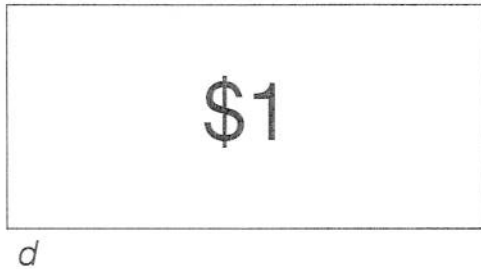
2. The distance of the Oregon Trail was about 2,000 mi long. This route would take settlers 4 months. Write a multiplication expression to show how many miles were crossed in a month on this route.

_____

_____

Three students are playing a math game. Each student gives a value for the variable in the expression and then evaluates the expression. The student with the greatest value wins the round. The students' variable values are given in the table.

| Student	Value
Bobby	10
Hannah	2
Carlos	4

3. The first expression is $(3 + 7) \times (10 - \frac{n}{2})$. Who wins the round? What is the value of the expression?

_____

_____

4. The next expression is $\frac{(3n + 2)}{2}$. Who wins the round? What is the value of the expression?
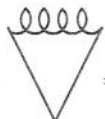
_____

Name_____

Trying Triangles

Each of the smaller triangles stands for the numbers 1–9. Use the expressions to identify the values. Write the correct numbers in all of the triangles. (Hint: Use try, check, and revise as a strategy.)
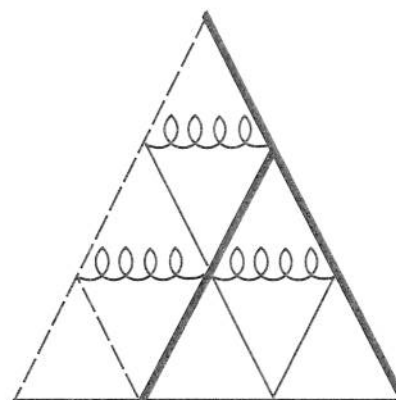
1.

2.

3.

4.

5.

Name_____

Table That Rule

E 3-14
REASONABLENESS

Below are some tables. Dewey, Corrie, and Isaac each try to guess the rule. If the rule is correct, write *Yes.* If the rule is incorrect, write the correct rule. Complete each table.

1. Dewey says, "The rule for this table is divide by 4."

Dewey's Table	16	32	56	48	12	18	24	30	n
	8	16	28						

_____

_____

2. Corrie says, "The rule for this table is multiply by 2, then subtract 1."

Corrie's Table	7	2	6	4	12	3	10	5	11	n
	13	3	11							

_____

_____

3. Isaac says, "The rule for this table is add 1."

Isaac's Table	2	9	6	4	3	5	8	7	9	n
	3	24	15	9						

_____

_____

Name_____

Palm Tree Planning

The word *palm* refers to a group of flowering plants that have large, showy leaves. The ideal climate for palms is one that is warm and humid. However, all palms are not the same. Below is a chart of palms and some of their characteristics.

Palm	Maximum Height	Characteristics
Saw Palm	5 ft	ground creeper aggressive grower
Mediterranean Fan Palm	5 ft	small, clumping leaves slow grower
Palmetto Palm	90 ft	large trunk; leaves gather at top like cabbage
Windmill Palm	40 ft	fan-shaped leaves slender trunk

A landscaper is using the different characteristics of palm trees in order to plant the right palm in the best place. Use the chart of palm trees to help you plan the landscape.

1. Which palm would you plant in front of a house to provide shade?

    _____

2. Which palm would you plant to provide quick ground cover in a bare area?

    _____

3. Which palm would you plant to decorate and shade a spot on a patio?

    _____

4. Which palm would you plant to border both sides of a driveway?

    _____