



Unit
Preview
Sampler

Student Workbook

GRADE
3

UNIT
1

Name _____

Introducing Multiplication



Imagine IM is the certified
Illustrative Mathematics
curriculum optimized for
engagement, accessibility,
and usability.

Introducing Multiplication

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GO ONLINE



Go online
to find the
videos for
this unit.



VIDEOS

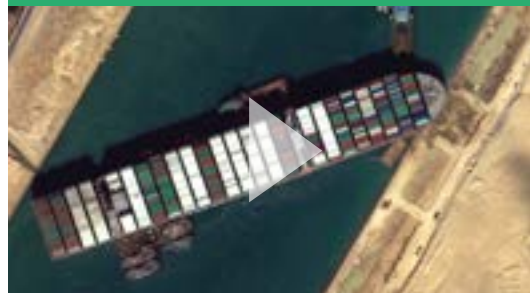
FAMILY SUPPORT

Unit 1 Family Support video



INSPIRE MATH

Traffic Trouble video



Section

A

Interpret and Represent Data in Scaled Graphs



**I will interpret and
draw picture graphs
and bar graphs to
represent data.**

Alignments

Building On
2.MD.D, 2.MD.D.10,
2.NBT.B.5, 2.OA.C.3,
2.OA.C.4

Addressing
3.MD.B, 3.MD.B.3

Building Towards
3.MD.B.3

Mathematical Practice
MP1, MP2, MP3, MP6,
MP7, MP8



Name	Date
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Lesson 1

Make Sense of Data

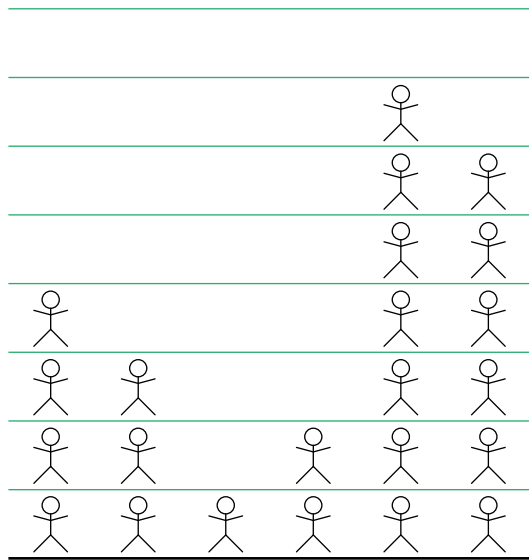
Let's read and ask questions about data.



WARM-UP Notice and Wonder

Graphs

What do you notice? What do you wonder?



Each  represents 1 student.

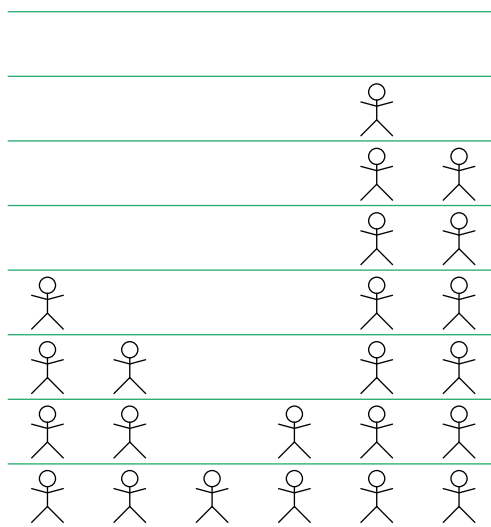
1

Picture Time

What could the categories be for this picture graph?

Be prepared to explain your reasoning.

How We Get Home



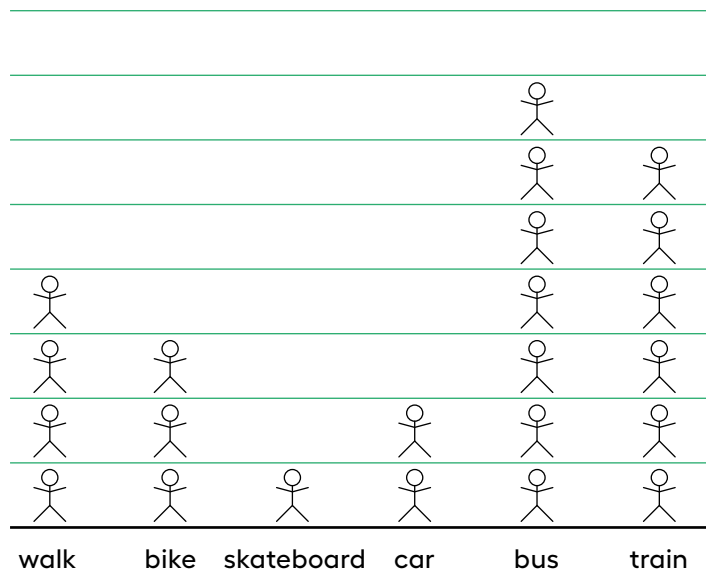
Each  represents 1 student.

2

Picture Graphs and Bar Graphs

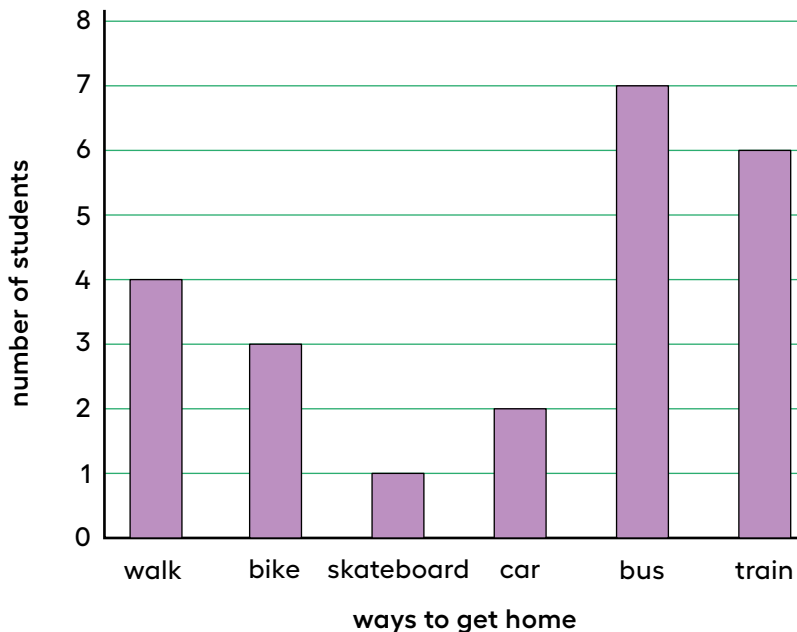
A group of students were asked, “How do you get home?” Their responses are shown in a picture graph and a bar graph.

How We Get Home



Each  represents 1 student.

How We Get Home



1 How are the 2 graphs alike? How are they different?

2 What can you learn about how students get home based on the graphs?

3 Write 2 questions that can be answered by reading the graphs.

Name

Date

Lesson 2

Represent Data and Solve Problems

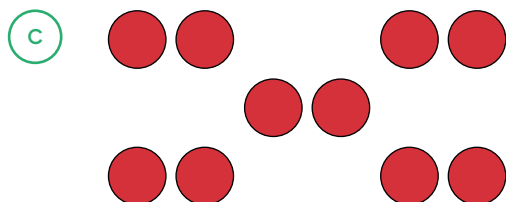
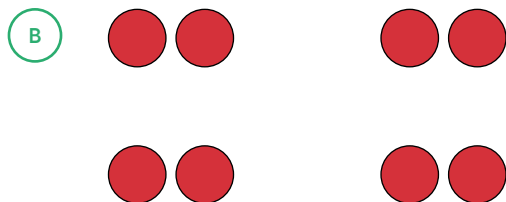
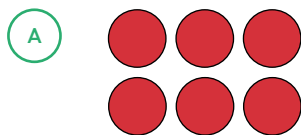
Let's create graphs and answer questions.

WARM-UP How Many Do You See



Dots in Groups

How many do you see? How do you see them?



1

How We Get Home

- 1 Follow your teacher's instructions to represent the class data in a picture graph.



- 2 Represent the same data in a bar graph.



2

Questions About a Bar Graph

1 Decide if each statement about how our class gets home is true or false. Use the graph to explain your reasoning to your partner.

a. More students walk than go home any other way.

b. More students ride home on a bus than in a car.

c. Fewer students walk home than ride their bikes.

d. More students walk or ride their bikes than ride in a van.

2 Fill in the blanks as directed by your teacher. Then answer each question.

a. "How many more students _____ than _____?"

b. "How many more students _____ or _____ than _____?"

Name

Date

Lesson 3

Scaled Picture Graphs

Let's explore scaled picture graphs.



WARM-UP Number Talk



Addition

Find the value of each expression mentally.

(A) $50 + 10$

(B) $50 + 12$

(C) $60 + 13$

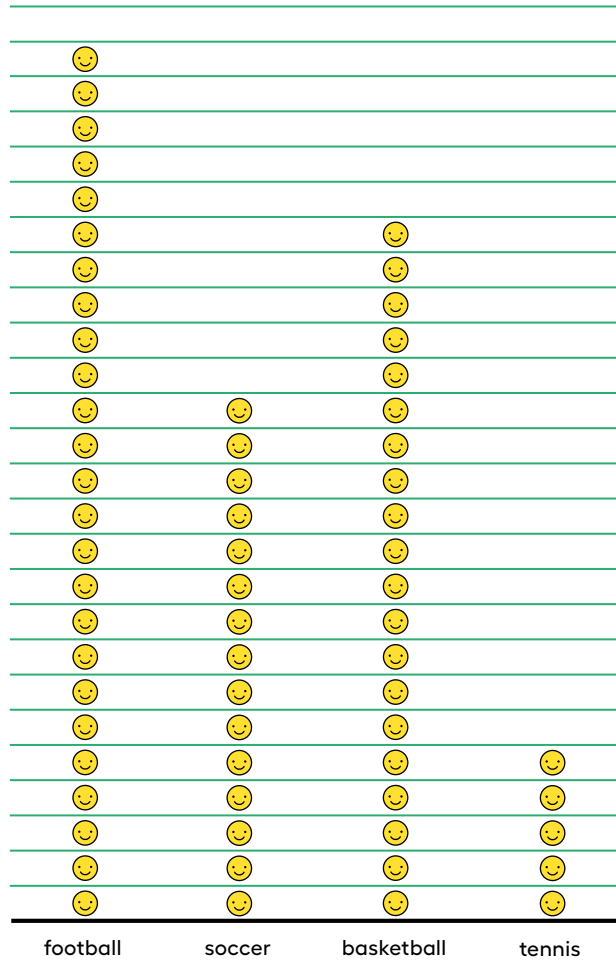
(D) $65 + 13$

1

So Many Responses

- 1 A group of students were asked, "Which of these 4 sports is your favorite?" Their responses are shown in this picture graph:

Favorite Sports

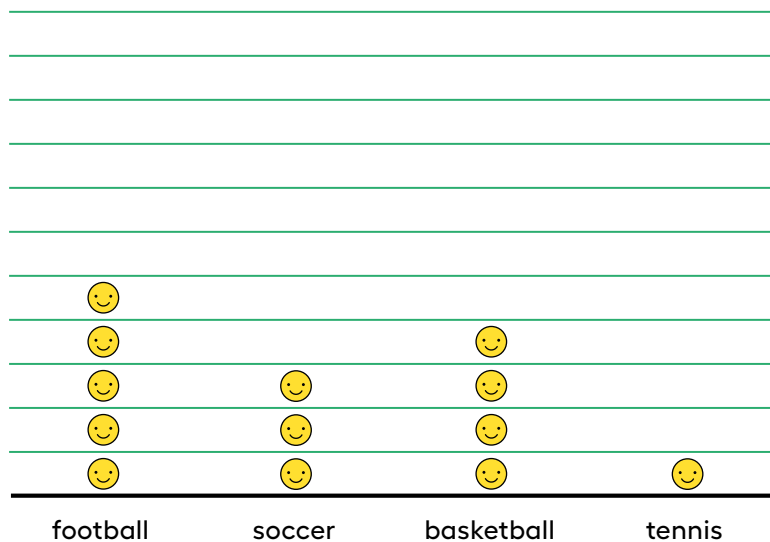


Each 😊 represents 1 student.

How many students are represented in the graph?

2 The students' responses are also shown in this picture graph:

Favorite Sports



Each 😊 represents 5 students.

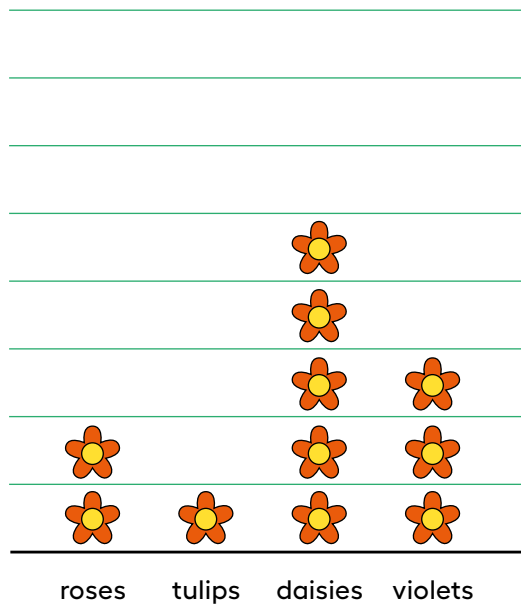
How is counting the total number of students in this graph different from counting the total number of students in the first graph?

2

Questions about Scaled Picture Graphs

- 1 Andre collected data to see how many of each type of flower he saw on the way home. The data is shown in this picture graph:

Flowers I Saw on the Way Home



Each  represents 5 flowers

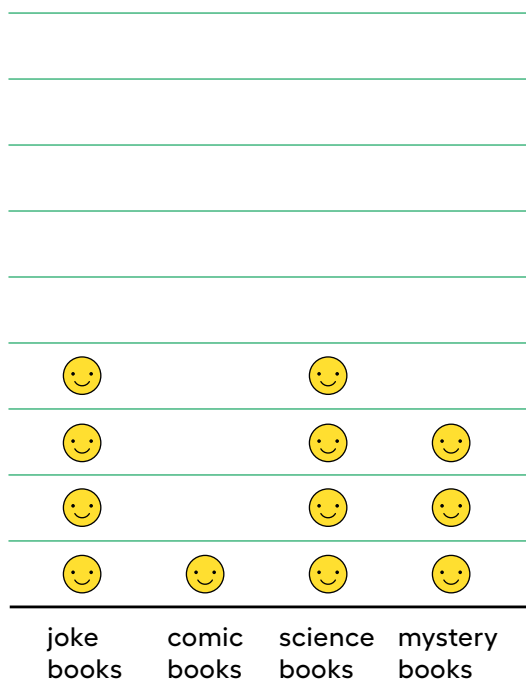
- a. How many of each type of flower did Andre see on the way home?

roses _____ tulips _____ daisies _____ violets _____

- b. Write 2 questions that can be answered by reading the graph.

2 A group of students were asked, “Which is your favorite type of book?”
 Their responses are shown in this picture graph:

Favorite Type of Books



Each 😊 represents 2 students

a. How many students chose each type of book? How do you know?

b. Write 2 questions that can be answered by reading the graph.

Name	Date
------	------

Lesson 4

Create Scaled Picture Graphs

Let's make a scaled picture graph.

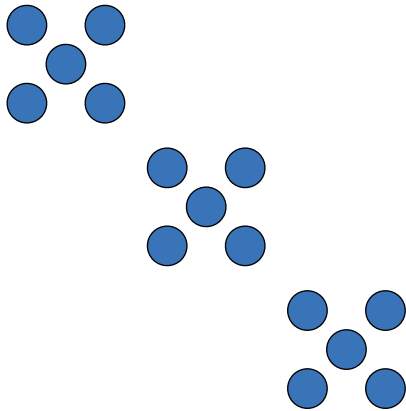
WARM-UP How Many Do You See



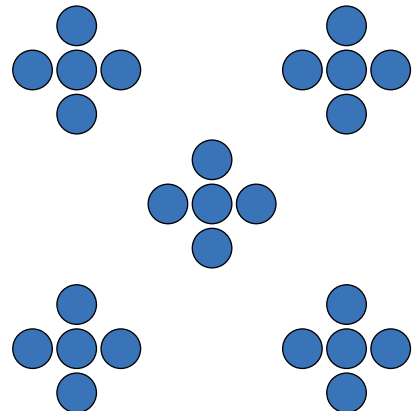
More Groups of Dots

How many do you see? How do you see them?

A



B



1

Ways to Travel

How would you like to travel?

- car (C)



- train (T)



- boat (B)



- balloon (Bal)



- plane (P)



- helicopter (H)



student's name	way of traveling

2

Create a Scaled Picture Graph

Represent the class survey data in a scaled picture graph. Have each picture represent 2 students.

A blank scaled picture graph grid. It consists of 10 horizontal lines and a vertical axis line on the left. The lines are spaced evenly, with the top and bottom lines being black and the middle eight lines being green. The vertical axis line is black and is positioned on the left side of the grid.

Name

Date

Lesson 5

Represent Data in Scaled Bar Graphs

Let's make a scaled bar graph.



WARM-UP Number Talk



Twos and Fives

Find the value of each expression mentally.

(A) $2 + 2 + 2 + 2$

(B) $2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$

(C) $5 + 5 + 5 + 5$

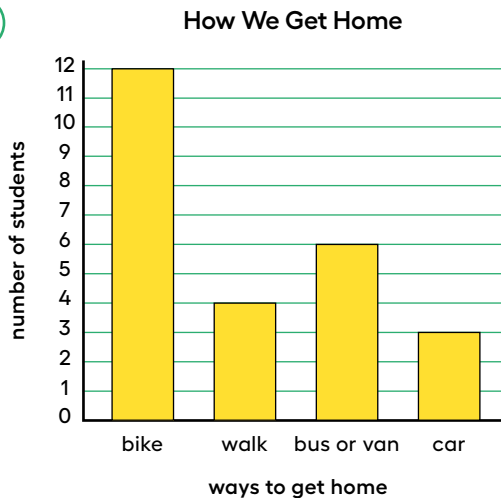
(D) $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$

1

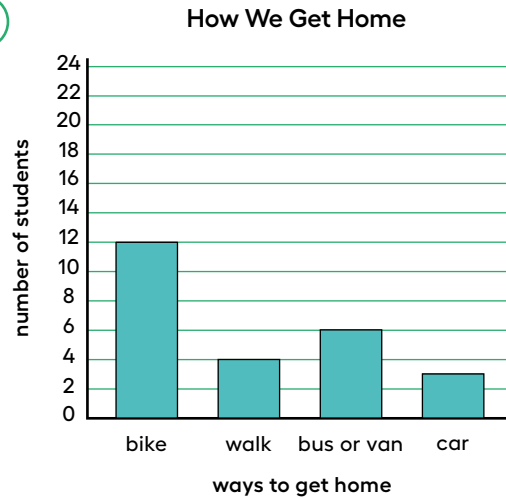
Compare Bar Graphs

All the students in a class were asked, “How do you get home from school?” Their responses are shown in these 2 bar graphs:

A



B



Discuss with your partner:
 How are the 2 graphs alike?
 How are they different?

2

Create a Scaled Bar Graph

Represent the data we collected earlier about travel choices in a scaled bar graph.

Use the graph with a scale of 2 or the graph with a scale of 5. If you have time, you can make 2 graphs. Be sure to label your title and categories.



Name

Date

Lesson 6

Choose a Scale

Let's choose a scale for our bar graph.



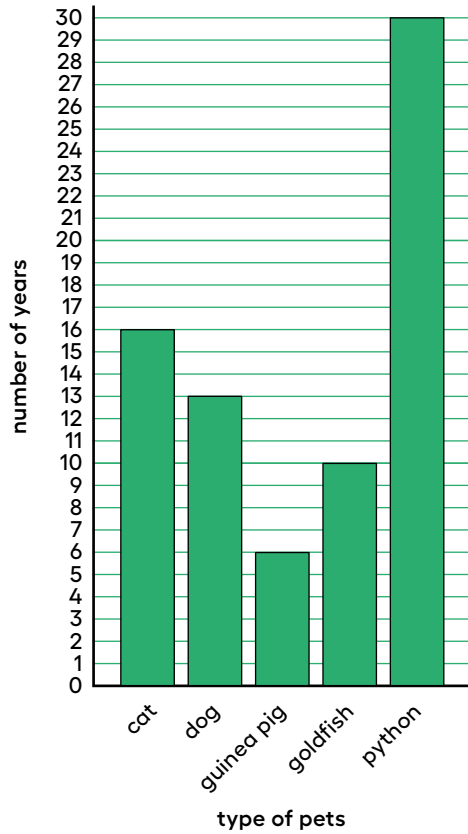


Bar Graph Scales

What do you notice? What do you wonder?

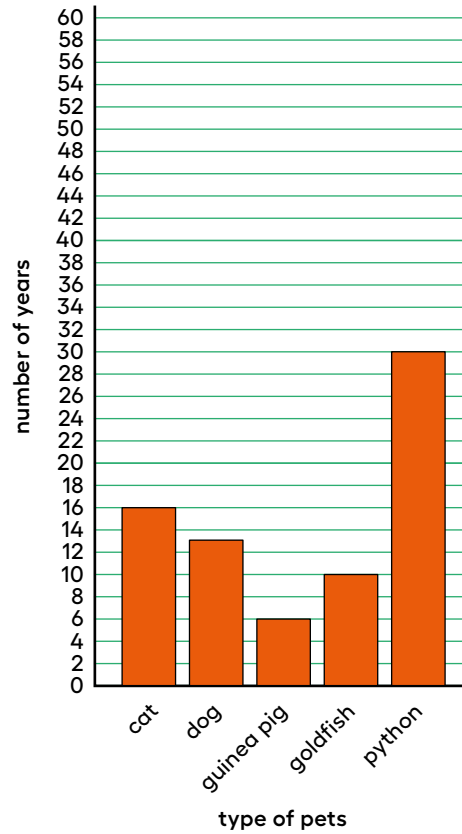
A

Lifespan of Pets



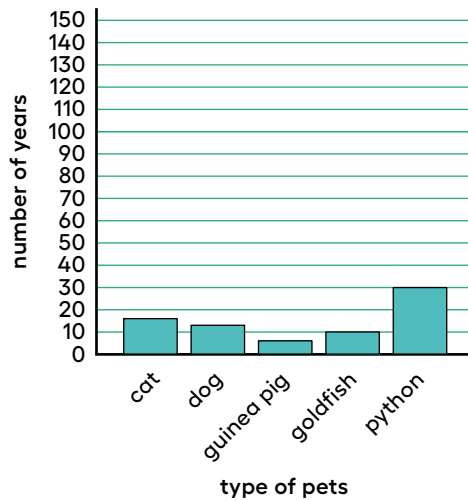
B

Lifespan of Pets



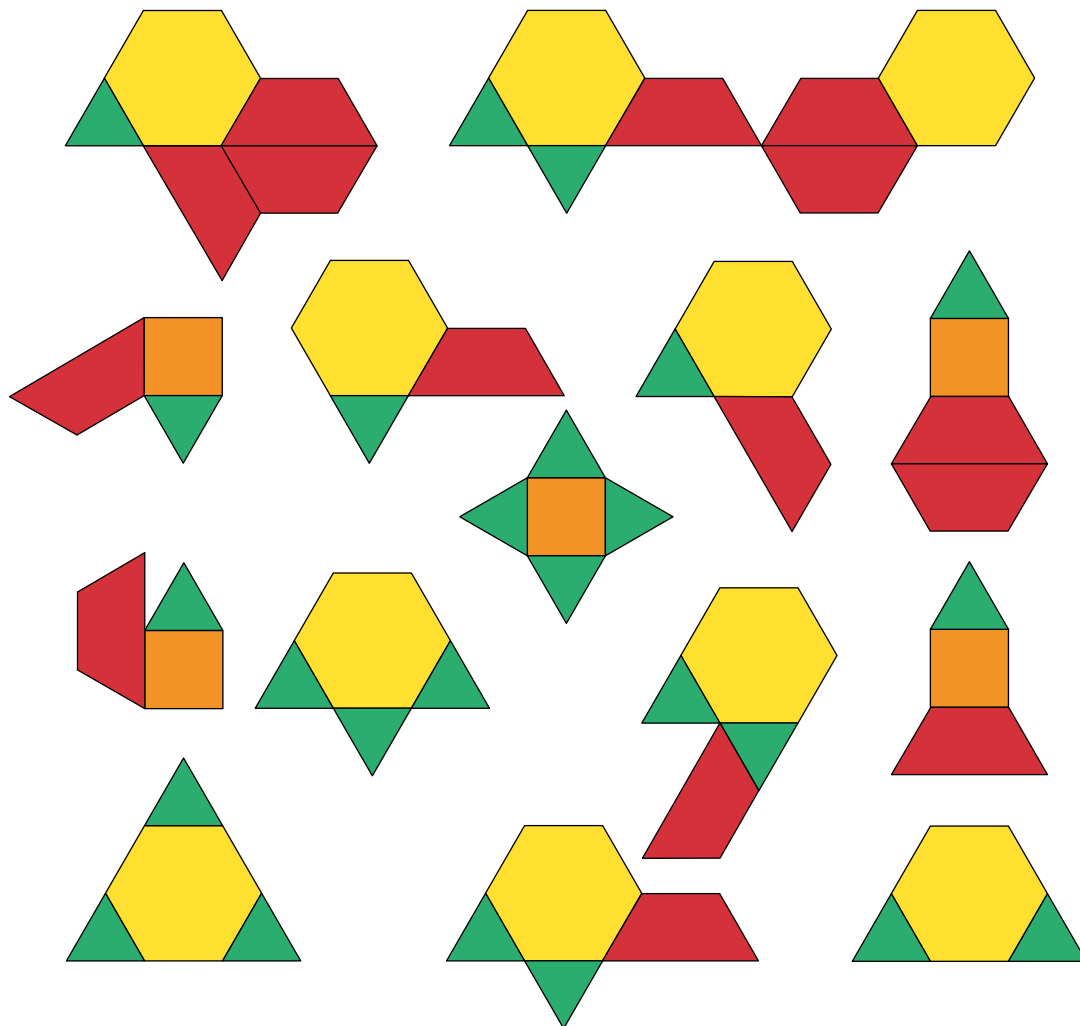
C

Lifespan of Pets



Represent Pattern Blocks

Here is a collection of pattern blocks.



Mai, Noah, and Priya want to make a bar graph to represent the number of triangles, squares, trapezoids, and hexagons in the collection.

- Mai says the scale of the bar graph should be 2.
- Noah says the scale of the bar graph should be 5.
- Priya says the scale of the bar graph should be 10.

1 Who do you agree with? Explain your reasoning.

2 Use the scale that you chose to create a scaled bar graph to represent the collection.



2

Represent More Data in a Scaled Bar Graph

All the third-grade students at a school were asked, “What is your favorite season?” Their responses are shown in this table:

favorite season of the year	number of students
winter	24
spring	13
summer	40
fall	22

Use the data from the table to create a scaled bar graph.



Name

Date

Lesson 7

Answer Questions about Scaled Bar Graphs

Let's solve problems based on data represented in bar graphs.

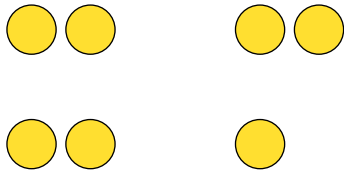
WARM-UP How Many Do You See



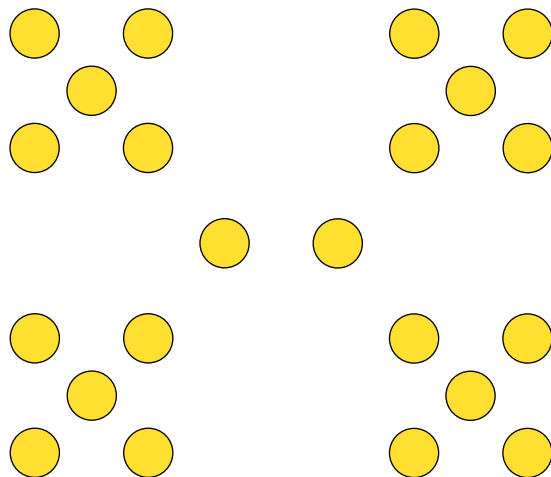
Groups of Dots

How many do you see? How do you see them?

A



B



1

Questions about Favorite Season of the Year

Use your Favorite Season bar graph to answer the questions. Show your thinking using expressions or equations.

1 How many students are represented in the graph? _____

2 How many students chose spring or fall as their favorite season? _____

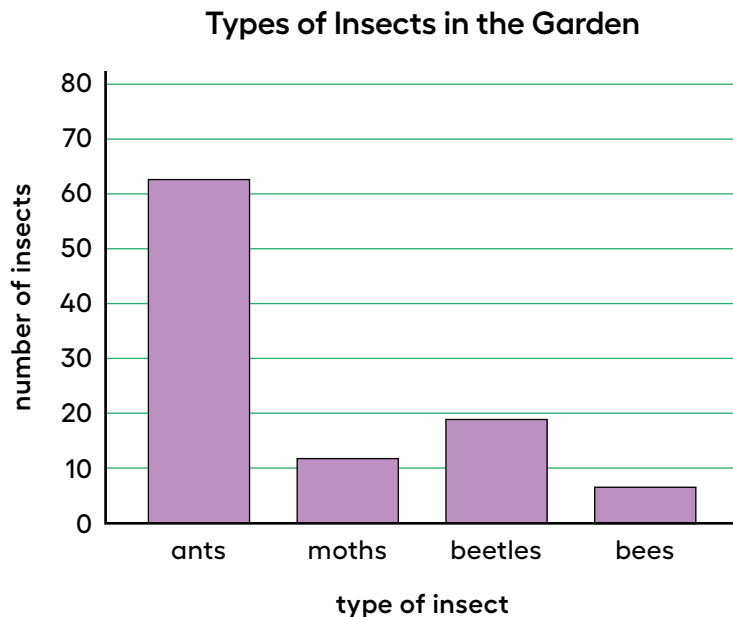
3 How many more students chose summer than winter? _____

4 How many fewer students chose spring than fall? _____

2

Questions about Insects in the Garden

Data was collected to see how many of each type of insect were in a garden. The data is shown in this bar graph:



Use the bar graph to answer the questions. Show your thinking using expressions or equations.

1 How many insects were in the garden? _____

2 How many more ants were in the garden than bees? _____

3 How many fewer moths were there than ants? _____

4 Work with your partner to write 2 other questions that can be answered by reading the graph.

5 Trade with another group and answer each other's questions.

Name

Date

Lesson 8

More Questions about Scaled Bar Graphs

Let's solve problems using data shown on bar graphs.



WARM-UP Number Talk



Repeated Addition

Find the value of each expression mentally.

(A) $2 + 2 + 2 + 2 + 2$

(B) $2 + 2 + 2 + 2 + 2 + 2$

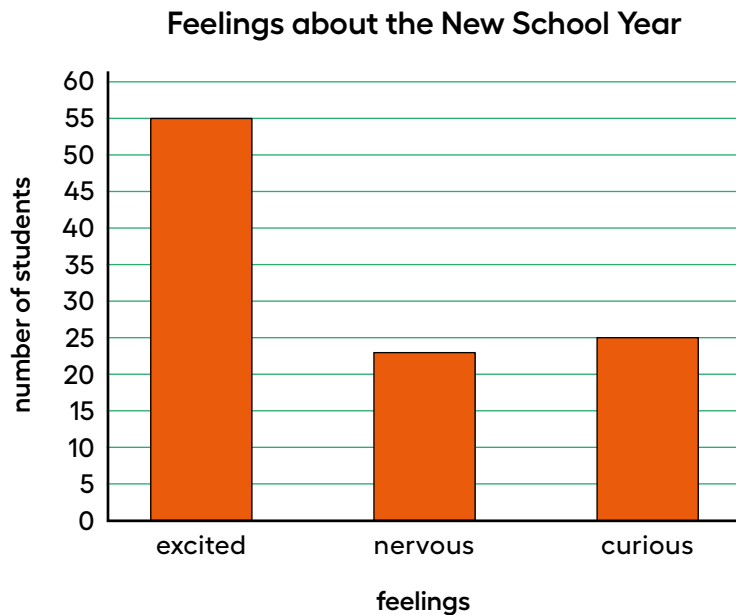
(C) $5 + 5 + 5 + 5 + 5 + 5$

(D) $5 + 5 + 5 + 5 + 5 + 5 + 5$

1

New School Year

A group of students were asked, “How are you feeling about the new school year?” Their responses are shown in this bar graph:

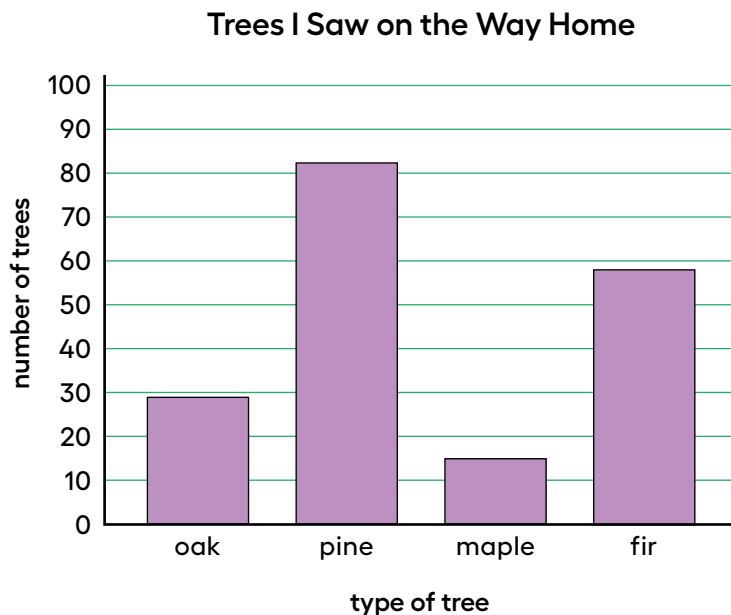


How many more students are excited about the new school year than are nervous or curious?

2

Use Bar Graphs to Solve Problems

The bar graph shows how many of each type of tree Clare saw on the way home. Use the graph to answer the questions. Show your thinking using expressions or equations.



1 How many more pine trees did Clare see than fir trees? _____

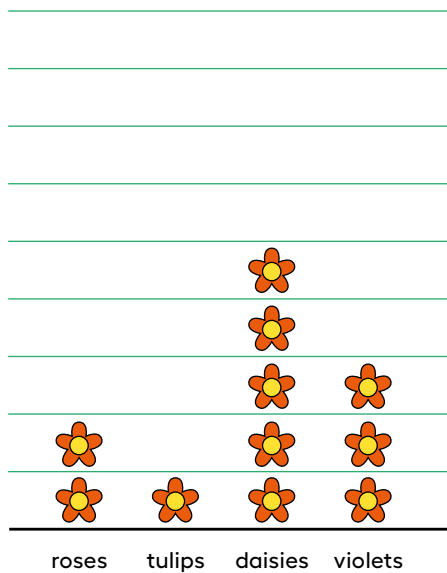
2 How many more pine trees did Clare see than oak or maple trees?

3 How many fewer oak trees did Clare see than pine trees?

4 How many fewer maple or oak trees did Clare see than fir trees?

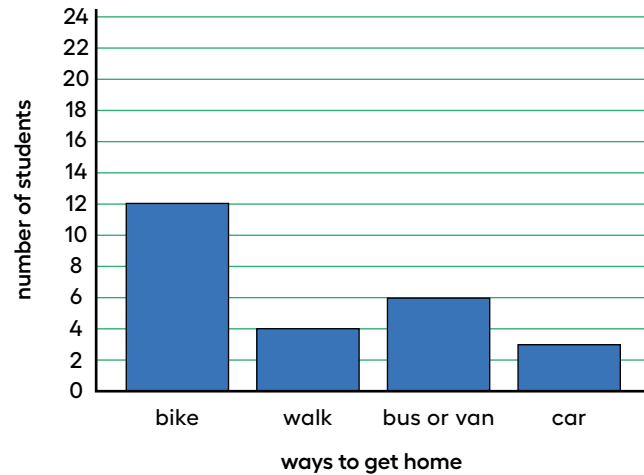
In this section, we created scaled picture graphs and scaled bar graphs.

Flowers I Saw on the Way Home



Each  represents 5 flowers.

How We Get Home



We asked and answered questions about data represented in the graphs.

- How many more daisies were seen than violets?
- How many fewer students walk home than bike home?
- How many more students bike home than walk or ride in a car?

Name

Date

SECTION

A

Practice Problems

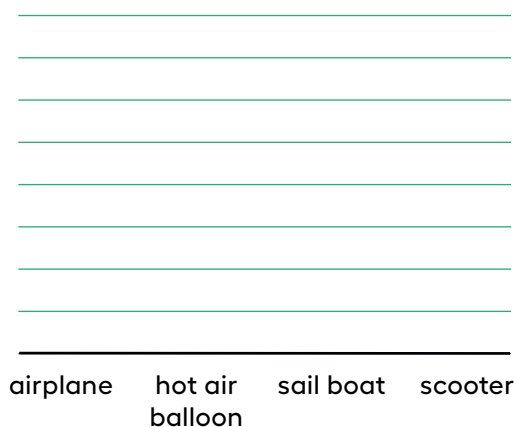
1

Pre-unit

The table shows how a group of students chose between 4 ways they would most like to travel. Use the table to complete the picture graph.

way to travel	number of students
airplane	4
hot air balloon	7
sail boat	6
scooter	3

Ways to Travel



2

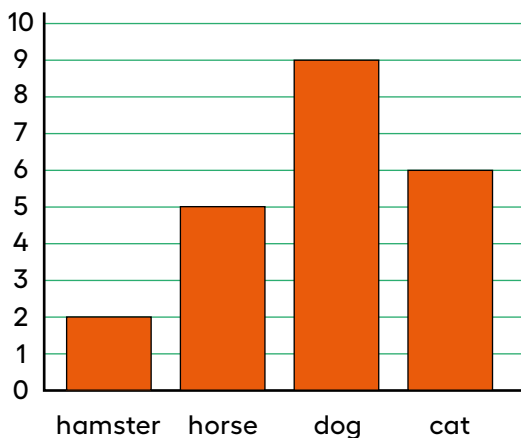
Pre-unit

Use the bar graph to answer the questions.

a. How many students recorded their favorite animal? _____

b. How many fewer students chose hamsters than dogs? _____

Favorite Animal



3

Pre-unit

The table shows the favorite summer vacation activity for a group of students.

vacation activities	number of students
family time	6
playing sports	8
sleeping in	5
reading	3

Use the table to complete the bar graph.

Favorite Vacation Activities



4

Pre-unit

Find each sum or difference. Show your reasoning.

a. $25 + 62$

b. $37 - 9$

c. $24 + 47$

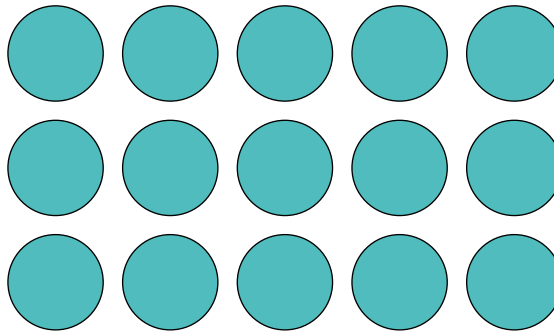
d. $84 - 59$

5

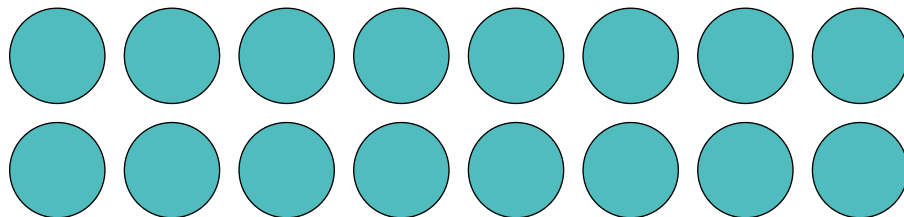
Pre-unit

How many objects are in each array? Explain or show your reasoning.

a.



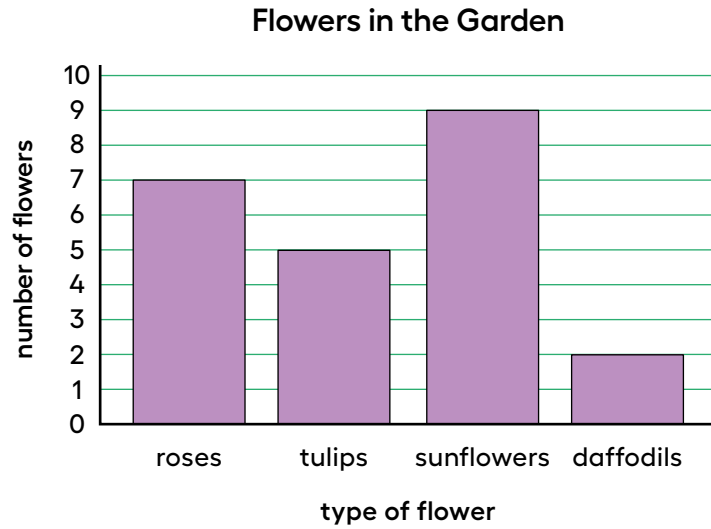
b.



6

from Unit 1, Lesson 1

The graph shows some information about flowers in the garden.



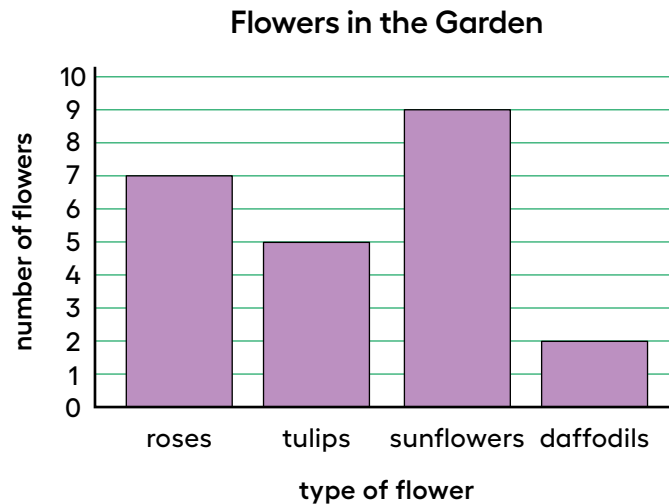
- a. Write 1 fact you know based on the data shown in the graph.

- b. Write 2 questions that can be answered by reading the graph.

7

from Unit 1, Lesson 2

The bar graph shows the numbers of different types of flowers in the garden. Use the graph to answer the questions.



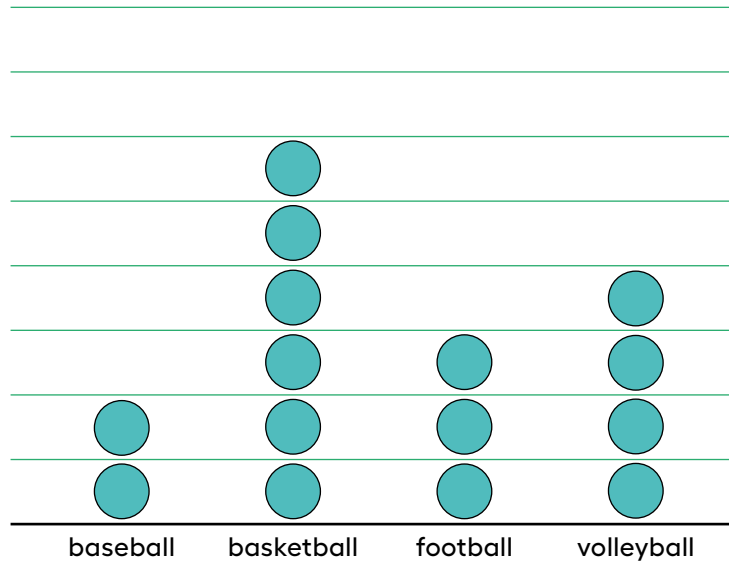
- a. How many flowers are represented on the graph? _____
- b. How many tulips, sunflowers, and daffodils are in the garden altogether?


8

from Unit 1, Lesson 3

This picture graph shows the numbers of different types of balls in the gym. Use the graph to answer the questions.

Balls in the Gym



Each  represents 2 balls.

- a. How many basketballs are in the gym? _____
- b. How many more basketballs are there than footballs? _____
- c. Write 1 other question that can be answered by reading the graph.

9 from Unit 1, Lesson 4

The table shows the favorite sports of some students. Use the table to complete the scaled picture graph.

sport	number
tennis	6
swimming	6
gymnastics	4
soccer	8



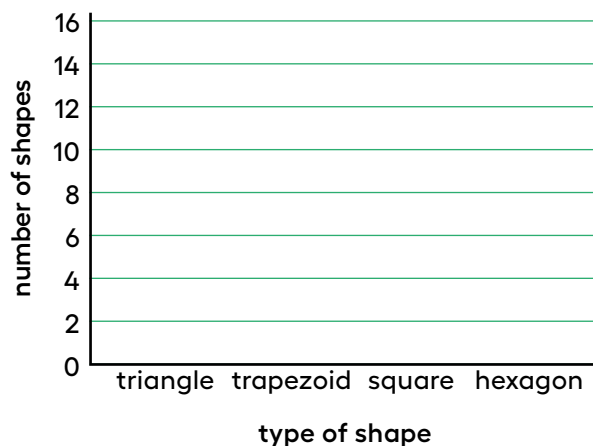
tennis swimming gymnastics soccer

Each ● represents 2 people.

10 from Unit 1, Lesson 5

The table shows the numbers of different shapes in a pattern block puzzle. Use it to complete the scaled bar graph.

shape	number
triangle	13
trapezoid	10
square	9
hexagon	15



11

from Unit 1, Lesson 6

The table shows the numbers of books some students have at home. Use the information from the table to create a scaled bar graph.

books	number
Elena	25
Andre	9
Tyler	16
Clare	21

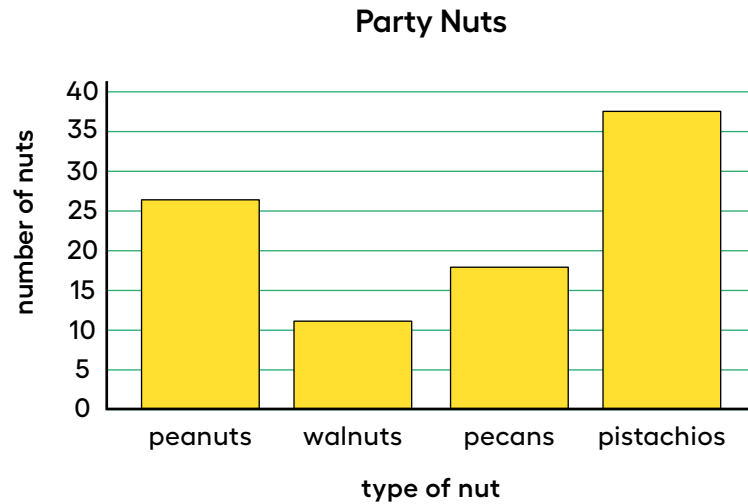
Books at Home



12

from Unit 1, Lesson 7

The bar graph shows the numbers of different kinds of nuts in a bowl.



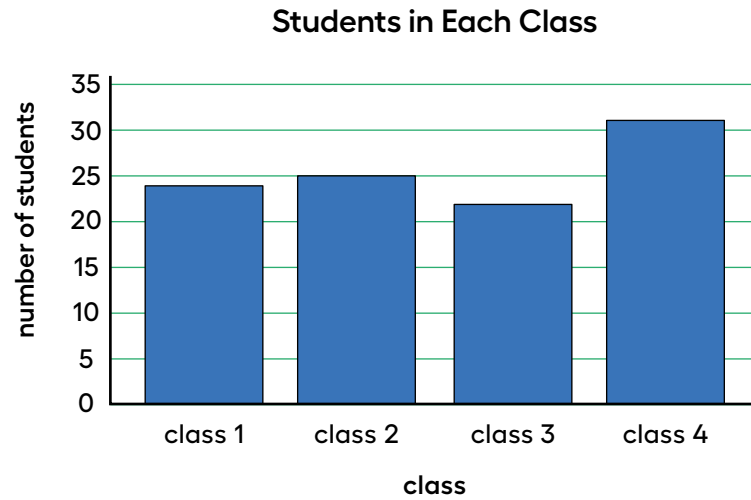
- a. How many more pistachios are there than walnuts? Explain or show your reasoning.

- b. How many fewer pecans are there than peanuts? Explain or show your reasoning.

13

from Unit 1, Lesson 8

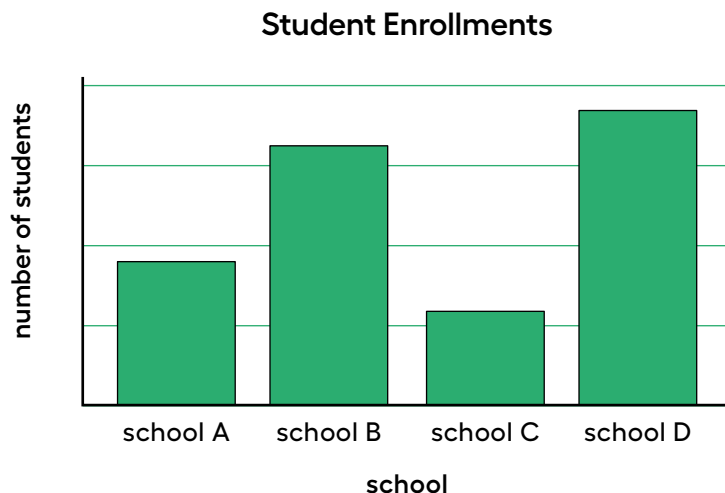
The bar graph shows how many students are in each class.



- a. How many students are in the 4 classes altogether? Explain or show your reasoning.

- b. How many fewer students are in Class 1 than in Class 4? Explain or show your reasoning.

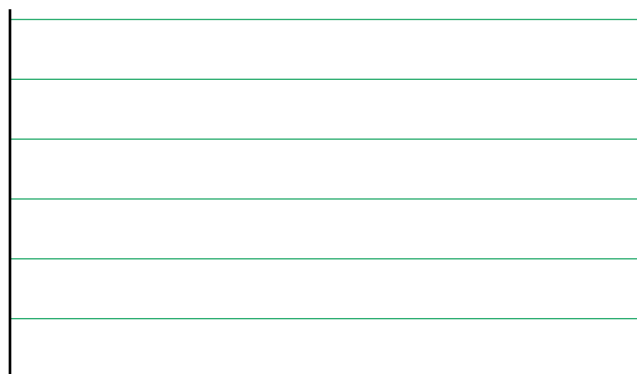
14 Exploration



The bar graph shows data about 1,000 students who attend 4 schools. What is the approximate scale for the bar graph? Explain or show your reasoning.

15 Exploration

Collect data of interest to you and represent the data on a bar graph. You may use the bar graph template if you wish.



Notes

Section

B

From Graphs to Multiplication



I will use drawings and tape diagrams to show equal groups and represent multiplication.

Alignments

Building On
2.NBT.B.5

Addressing
3.OA.A, 3.OA.A.1,
3.OA.A.3, 3.OA.A.4,
3.OA.C.7, 3.OA.D.9

Building Towards
3.OA.A.1

Mathematical Practice
MP2, MP3, MP4, MP6,
MP7, MP8



Name

Date

Lesson 9

Multiplication as Equal Groups

Let's work with equal groups of things.



WARM-UP Number Talk



More Addition

Find the value of each expression mentally.

(A) $40 + 35$

(B) $45 + 35$

(C) $45 + 36$

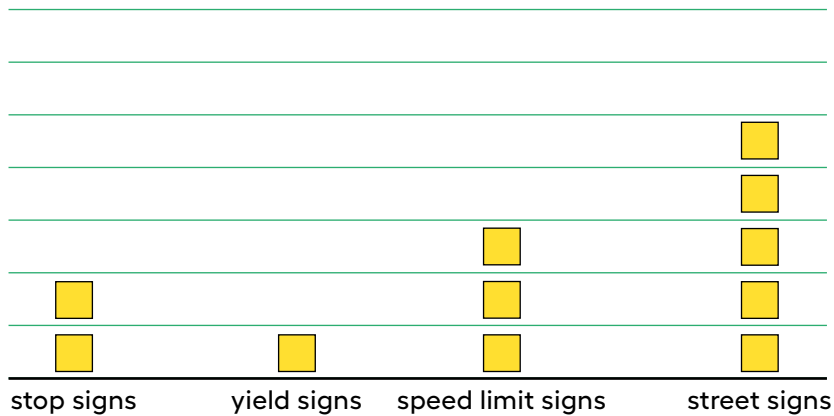
(D) $34 + 58$

1

From Scaled Graphs to Equal Groups

Elena collected data about signs she saw on the way home. The data is shown in this picture graph:

Signs I Saw on the Way Home



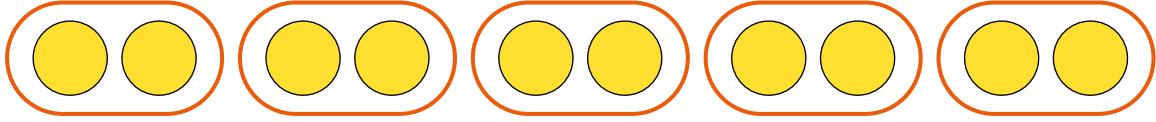
Each  represents 2 signs.

1 Represent the number of speed limit signs Elena saw on the way home.

2 Which statement describes how the graph represents the number of speed limit signs Elena saw? Explain your reasoning.

- (A) There are 3 pictures, and each picture represents 1 speed limit sign.
- (B) There are 3 pictures, and each picture represents 2 speed limit signs.
- (C) There are 2 pictures, and each picture represents 2 speed limit signs.

3 How could this drawing represent the street signs Elena saw on the way home?



2

Situations with Equal Groups

Represent each situation.

- 1 There are 4 people wearing shoes. Each person is wearing 2 shoes.

- 2 There are 2 boxes of markers. Each box has 10 markers.

- 3 There are 3 basketball teams. Each team has 5 players.

Name

Date

Lesson 10

Situations, Drawings, and Diagrams, Oh My!

Let's represent equal groups.



WARM-UP Notice and Wonder



Socks

What do you notice? What do you wonder?

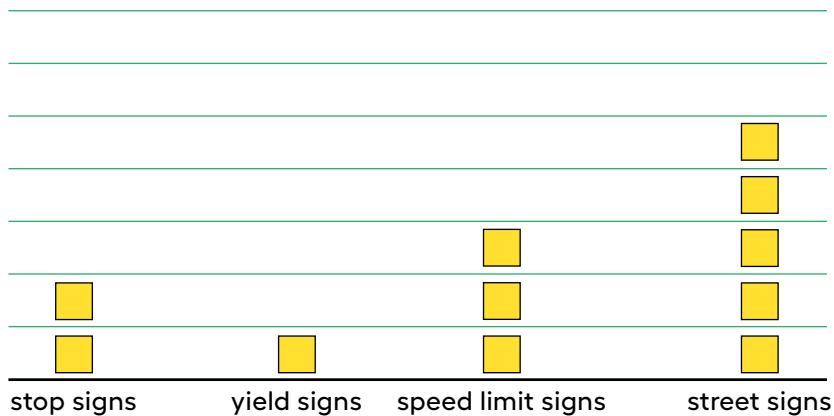


1

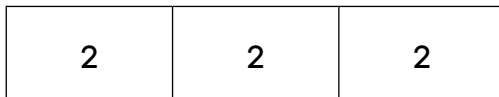
Scaled Picture Graph to Diagram

The graph shows the number of signs Elena saw on the way home.

Signs I Saw on the Way Home



Each  represents 2 signs.



1 How does the diagram represent the speed limit signs that Elena saw?

2 Represent the data from another category in the graph with your own drawing or diagram.

2

Equal Groups

Your teacher will give you a set of cards that show situations, drawings, and diagrams.

1 Find the cards that match. Be ready to explain your reasoning.

2 Create a drawing or diagram for each situation.

a. There are 4 bags. Each bag has 2 strawberries.

b. There are 4 hands. Each hand has 5 fingers.

Name

Date

Lesson 11

Multiplication Expressions

Let's write multiplication expressions.



ACTIVITY

1

Multiplication Expression Match

Your teacher will give you a card showing a situation, a drawing, or a diagram. Match it to 1 of the expressions posted around the room. Be prepared to explain your reasoning.

Expressions to Drawings and Diagrams

1 Create a drawing or diagram for each expression. Explain your reasoning.

a. 5×2

b. 3×4

c. 3×10

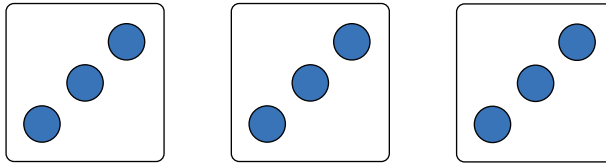
2 Write your own expression and matching diagram. Explain your reasoning.

3

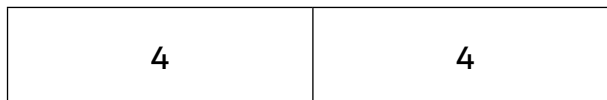
Write Multiplication Expressions

Write a multiplication expression to match each situation, drawing, or diagram.
Explain your reasoning.

1



2



3

There were 2 packs of water. Each pack had 6 bottles of water.

Name	Date
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Lesson 12

Represent and Solve Multiplication Problems

Let's represent and solve problems involving equal groups.

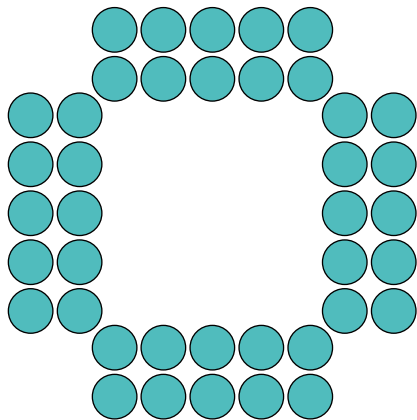
WARM-UP How Many Do You See



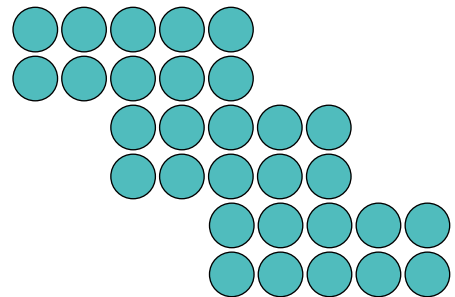
Lots of Dots

How many do you see? How do you see them?

A



B



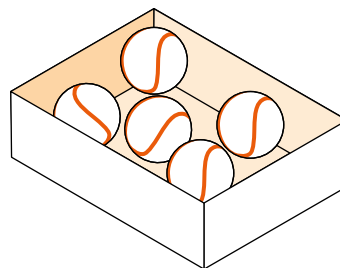
1

Tyler's Boxes

Tyler has 3 boxes. He has 5 baseballs in each box.

How many baseballs does he have altogether? _____

Show your thinking using diagrams, symbols, or other representations.



2

Solve Equal Groups Problems

Solve each problem. Show your thinking using diagrams, symbols, or other representations.

1 There are 4 soccer fields. Two teams are on each field. How many teams are there altogether? _____

2 There are 7 windows. Each window has 2 pieces of glass. How many pieces of glass are there in the windows? _____

3 Jada has 5 bags. Each bag has 10 earrings. How many earrings does Jada have? _____

4 Kiran has 4 boxes. Each box has 5 pencils in it. How many pencils does Kiran have? _____

5 Andre has 3 bags of carrots. Each bag has 10 carrots. How many carrots does Andre have? _____

Name

Date

Lesson 13

Multiplication Equations

Let's learn about multiplication equations.



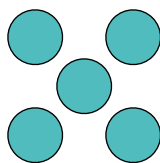
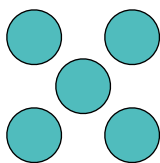
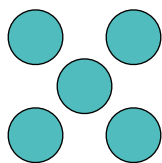
WARM-UP Which Three Go Together



Representations

Which 3 go together?

A



B

3×5

C

$2 \times 5 = 10$

D

$7 + 8 = 15$

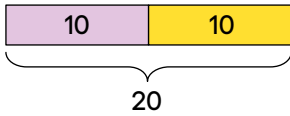
1

Multiplication Equation Match

Find an equation from the list that can represent each situation, drawing, or diagram. Record the equation. Be prepared to explain your reasoning.

- $3 \times 5 = 15$
- $10 = 5 \times 2$
- $16 = 8 \times 2$
- $4 \times 10 = 40$
- $30 = 6 \times 5$
- $4 \times 5 = 20$
- $2 \times 10 = 20$
- $4 \times 2 = 8$
- $50 = 5 \times 10$

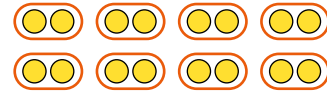
1



2

Andre has 5 pairs of socks

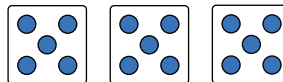
3



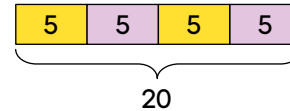
4

There are 6 hands on the table. Each hand has 5 fingers.

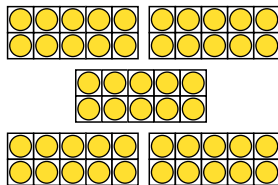
5



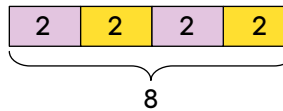
6



7



8



9

There are 4 boxes of markers. Each box has 10 markers.

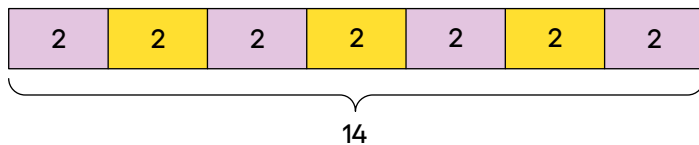
2

Write Multiplication Equations

Write a multiplication equation that represents each situation, drawing, or diagram. Be prepared to explain your reasoning.

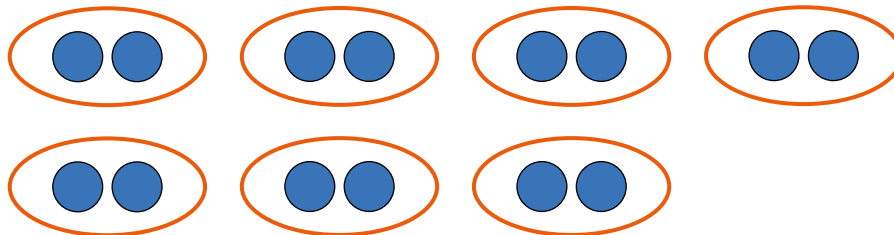
- 1 A package has 6 pairs of socks.

2

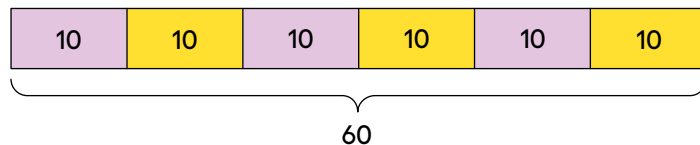


- 3 Diego has 7 sections in his notebook. Each section has 10 pages.

4

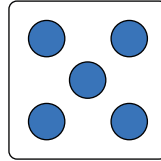
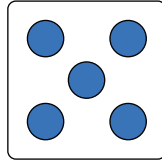
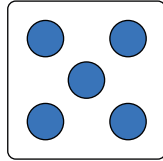
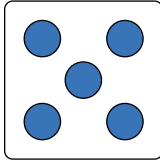
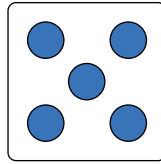
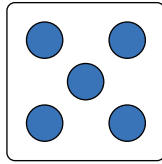
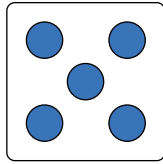
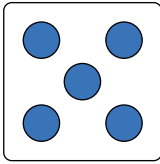


5



6 Elena has 4 bags of oranges. Each bag has 5 oranges in it.

7



Name

Date

Lesson 14

Write and Solve Equations with Unknowns

Let's work with equations with unknown numbers.



WARM-UP Number Talk



Fives

Find the value of each expression mentally.

(A) 1×5

(B) 2×5

(C) 3×5

(D) 4×5

1

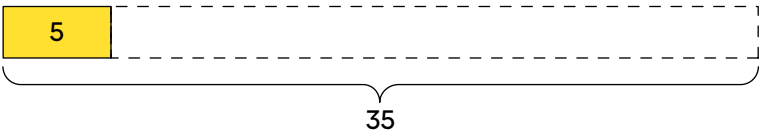
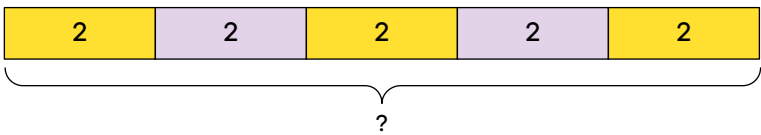
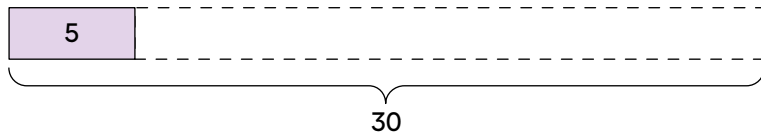
Unknown Numbers

Your teacher will give you a set of cards. Match each equation to a situation or diagram. Be ready to explain your reasoning.

2

Write Equations with an Unknown Number

- Write a multiplication equation to represent each diagram or situation. Use a symbol for the unknown. Be prepared to share your reasoning.
- Find the number that makes each equation true. Rewrite the equation with the solution.

diagram or situation	equation with symbol	equation with solution
		
<p>Jada has some packs of sports cards. Each pack has 5 cards. If Jada has 45 cards, how many packs of cards does she have?</p>		
		
		
<p>The school has 6 bags. Each bag has 10 basketballs in it. How many basketballs does the school have?</p>		

Name

Date

Lesson 15

More Factors, More Problems

Let's solve more multiplication problems.



WARM-UP Number Talk



Tens

Find the value of each expression mentally.

(A) 1×10

(B) 2×10

(C) 3×10

(D) 4×10

1

Represent Situations with Equations

For each problem:

- Write a multiplication equation with a symbol for the unknown to represent the situation.
- Find the number that makes the equation true. Show your reasoning.

1 There are 15 bottles of paint. Han placed 5 bottles of paint on each table. How many tables have paint on them?

a. equation: _____

b. solution:

2 Lin's class has 6 tables. Each table has 2 bags of clay. How many bags of clay does the class have?

a. equation: _____

b. solution:

3 Han's class has 60 markers. There are 10 markers in a pack. How many packs of markers does the class have?

a. equation: _____

b. solution:

2

Multiplication Mashup

Solve each problem. Explain or show your reasoning.

- 1 Clare has 16 socks. She puts them in piles of 2. How many piles can she make?

- 2 Diego has 8 piles of socks. Each pile has 2 socks. How many socks does Diego have?

- 3 Andre has 16 socks. He puts them in 8 groups that are the same size. How many socks are in each group?

4 A store has 9 boxes. Each box has 5 shirts. How many shirts are there?

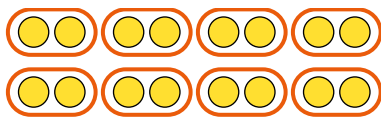
5 There are 80 sweaters in piles on a shelf. Each pile has 8 sweaters. How many piles of sweaters are on the shelf?

In this section, we learned about equal groups. We created drawings and diagrams to represent situations that involve equal groups.

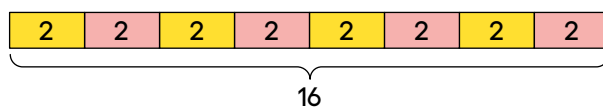
Situation

Diego has 8 piles of socks. Each pile has 2 socks.

Drawing



Diagram



We wrote multiplication expressions and equations to represent equal groups.

Expression

$$8 \times 2$$

Equation

$$8 \times 2 = 16$$

We learned that the numbers that are multiplied are called **factors** and the number that is the result of multiplying is called a **product**. In the equation $8 \times 2 = 16$, the numbers 8 and 2 are the factors and 16 is the product.

Name	Date
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SECTION
B Practice Problems

1 from Unit 1, Lesson 9

There are 6 tennis courts. There are 2 players on each tennis court.

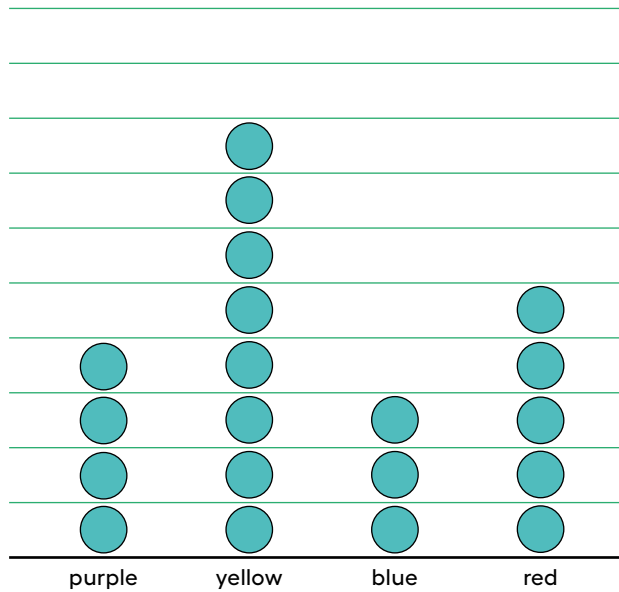
Create a drawing or diagram to represent the tennis players. Then, find how many players are on the tennis courts. Explain or show your reasoning.

2

from Unit 1, Lesson 10

The picture graph shows the favorite colors of some people.

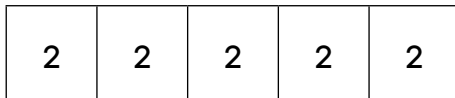
Favorite Colors



Each  represents 2 people.

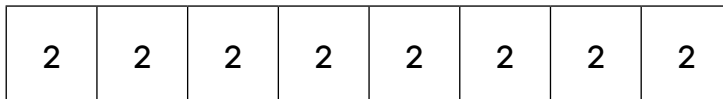
Match each diagram or drawing to the number of people who chose each color.

A



1 red

B



2 blue

C



3 purple

D



4 yellow

3

from Unit 1, Lesson 11

Create a drawing or diagram to represent the expression 4×3 .

4

from Unit 1, Lesson 12

There are 4 stacks of books on the table. Each stack has 5 books. How many books are on the table? Explain or show your reasoning.

5

from Unit 1, Lesson 13

There are 6 basketball teams in the gym. There are 5 people on each team. How many people are on the basketball teams in the gym?

- a. Write a multiplication equation with a symbol for the unknown to represent the situation.

- b. Find the number that makes the equation true. Show your reasoning.

6

from Unit 1, Lesson 14

Write a multiplication equation for the situation. Use ? for the unknown. Find the number that makes the equation true.

There are 4 soccer teams. Each soccer team has 10 players. How many players are there altogether?

7

from Unit 1, Lesson 15

Solve each problem. Explain or show your reasoning.

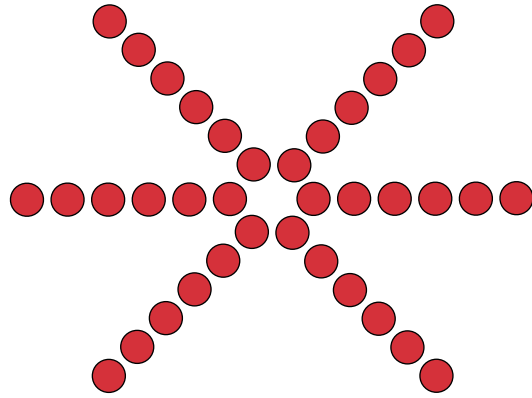
- a. There are 6 flowers. Each flower has 5 petals. How many petals are there?

- b. There are 50 petals on some flowers. Each flower has 5 petals. How many flowers are there?

8

Exploration

Write an expression for the number of circles in the image. Then, find the number of circles.

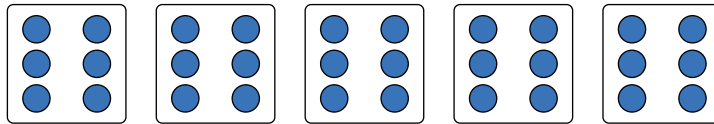


9

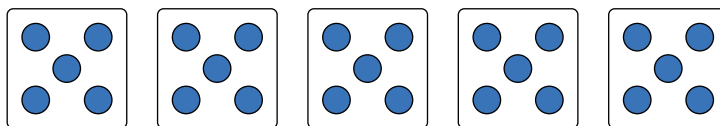
Exploration

For each image, determine if there is an even or odd number of circles. Explain or show your reasoning.

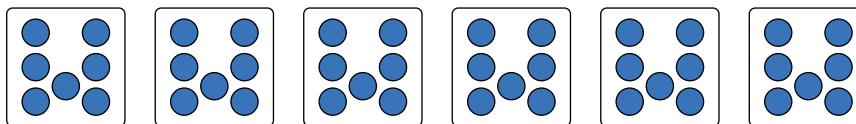
a.



b.



c.



10

Exploration

Look outdoors or in your school or home to find some equal groups of objects.

a. Describe the objects.

b. Create a drawing to represent the objects.

c. Write an equation showing how many objects there are.

Section

C

Represent Multiplication with Arrays and the Commutative Property



I will represent multiplication with arrays.

Alignments

Building On
2.NBT.B.5, 2.OA.C.4

Addressing
3.MD.B.3, 3.OA.A, 3.OA.A.1, 3.OA.A.3, 3.OA.B.5, 3.OA.C.7, 3.OA.D.9

Building Towards
3.NBT.A.2, 3.OA.A.1

Mathematical Practice
MP2, MP3, MP4, MP6, MP7, MP8



Name	Date
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Lesson 16

Arrange Objects into Arrays

Let's make some arrays.

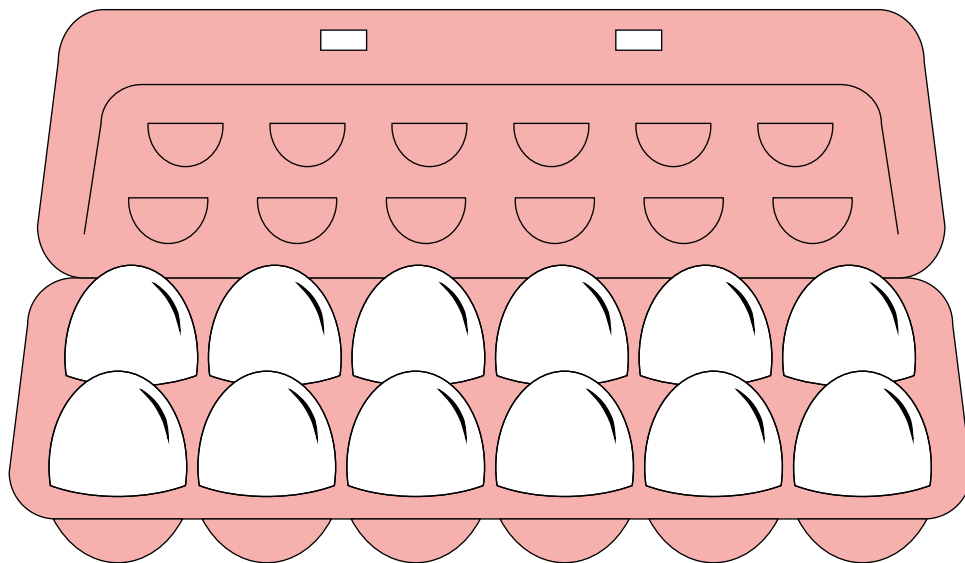


WARM-UP Notice and Wonder



Eggs

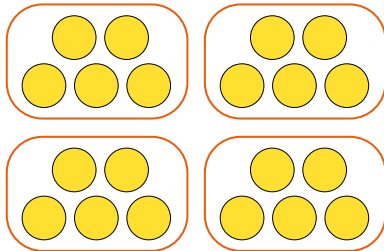
What do you notice? What do you wonder?



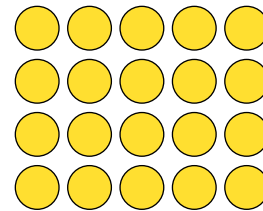
1

Compare Equal Groups and Arrays

A



B



1 How does arranging the dots into an array affect how you see the number?

2 Noah says he sees equal groups in the drawing with 4 circles and 5 dots in each circle, but says there are no equal groups in the array. Do you agree with Noah? _____

Explain your reasoning.

2

Arrange into Arrays

1 Use cubes to make 6 groups of 5.

- Arrange them into an array.
- Explain or show how the array is related to equal groups.

2 Count out 20 cubes.

- Arrange them into as many arrays as you can.
- Explain or show how each array is related to equal groups.

3 Count out 24 cubes.

- Arrange them into as many arrays as you can.
- Explain or show how each array is related to equal groups.

Name

Date

Lesson 17

Match and Draw Arrays

Let's match arrays to equal groups and draw arrays.

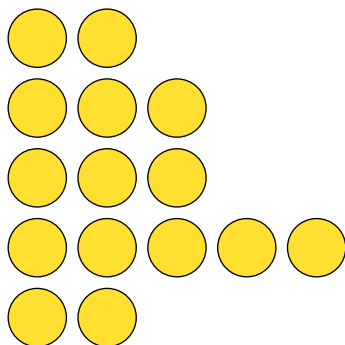
WARM-UP Which Three Go Together



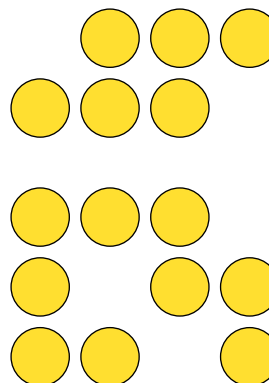
Arrangements

Which 3 go together?

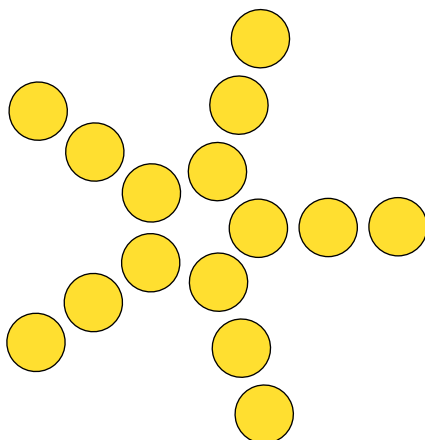
A



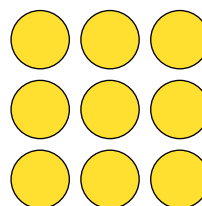
B



C



D



1

Arrays

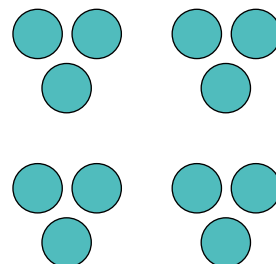
Your teacher will give you a set of cards.

- 1 Match each drawing of equal groups to an array. Be ready to explain your reasoning.
- 2 Choose a match you and your partner made. Write down how you know the drawing matches the array.

2

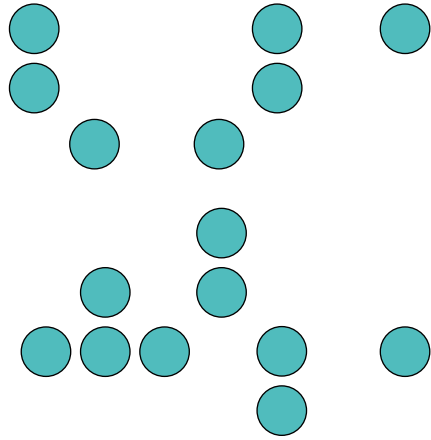
Draw Arrays

- 1 a. Draw 1 way the dots could be rearranged into an array.



- b. Explain or show how the array is related to multiplication.

- 2 a. Draw ways that the dots could be arranged into arrays. Draw as many ways as you can.



- b. Explain or show how each array is related to multiplication.

Name

Date

Lesson 18

Represent Arrays with Expressions

Let's represent situations with arrays and expressions.

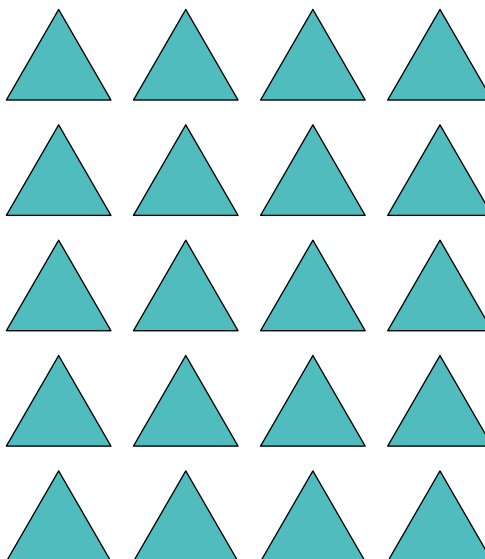


WARM-UP How Many Do You See



An Array of Shapes

How many do you see? How do you see them?



1

Represent Array Situations

1 Use objects or drawings to represent each situation with an array.

a. There are 3 rows of chairs. Each row has 5 chairs.

b. There are 4 rows of cars. Each row has 5 cars in it.

c. There are 2 rows of eggs. Each row has 6 eggs.

d. There are 2 teams of students lined up. Each team has 10 students.

2 Write a multiplication expression to represent each situation.

a. _____

b. _____

c. _____

d. _____

2

Connect Arrays to Expressions

Draw an array for each multiplication expression. Be prepared to share your reasoning.

1 2×3

2 5×2

3 4×4

Name

Date

Lesson 19

Solve Problems Involving Arrays

Let's solve problems involving arrays.



WARM-UP Number Talk



One Less Group

Find the value of each expression mentally.

A 10×2

B 9×2

C 8×2

D 7×2

1

Array of Colors

There are 7 rows. Each row has 5 crayons. How many crayons are there?

- 1 Solve this problem. Explain or show your reasoning.

- 2 Represent the situation with an array and a multiplication equation with a symbol for the unknown.

2

Tyler's Trees

For each problem:

- Write a multiplication equation with a symbol for the unknown to represent the situation.
- Solve the problem. Show your reasoning.

- 1 A field of coconut trees in Mexico has 5 rows of trees. Each row has 9 trees. How many trees are there?

- 2 Tyler wants to plant coconut trees in a community garden in Florida. He will plant 2 rows of 4 trees.

How many trees will Tyler plant? _____



Name

Date

Lesson 20

The Commutative Property

Let's learn about the commutative property.



WARM-UP Number Talk



Subtraction

Find the value of each expression mentally.

(A) $70 - 10$

(B) $68 - 10$

(C) $70 - 12$

(D) $68 - 12$

1

Learn More about Multiplication

What do you notice? What do you wonder?

Image A

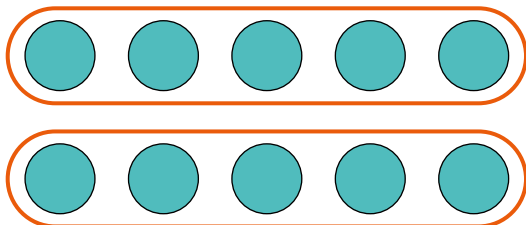
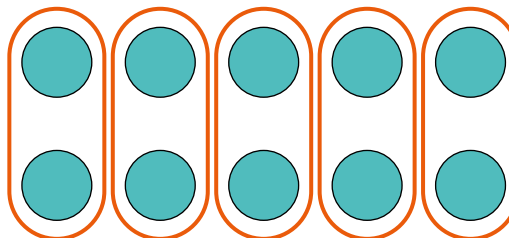


Image B



- 1 a. Write a description of a situation for each array.

Image A

Image B

- b. How are the situations alike? How are they different?

- 2 a. Write a multiplication equation for each situation.

Image A

Image B

- b. How does your equation connect to the situation and array?

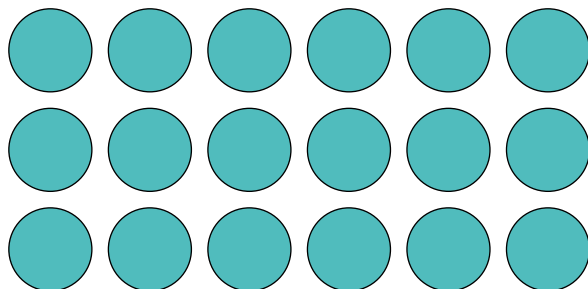
Image A

Image B

2

Revisit Arrays

- 1 Write 2 multiplication equations that represent the array.



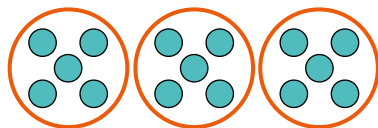
- 2 Explain why both equations can represent the array.

C

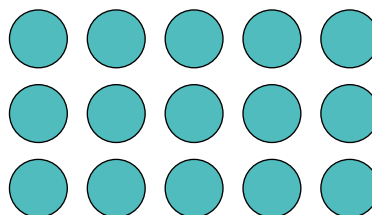
Summary

In this section, we learned how equal groups are related to arrays and how to represent arrays with multiplication expressions and equations.

Equal groups



Array



Expression

$$3 \times 5$$

Equation

$$3 \times 5 = 15$$

We also learned that we can multiply numbers in any order and get the same product.

$$3 \times 5 = 15$$

$$5 \times 3 = 15$$

$$3 \times 5 = 5 \times 3$$

Name

Date

Lesson 21

Game Night Seating Plan

Let's plan a game night.

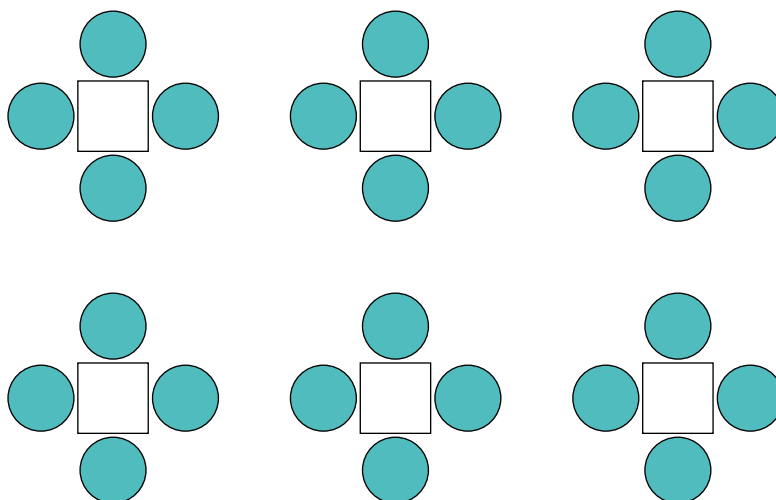


WARM-UP Notice and Wonder



Squares and Circles

What do you notice? What do you wonder?



1

Game Night

Your club is planning a game night.

Guests can play 1 of 4 different games that require a different number of players:

- Game A – 2 players
- Game B – 4 players
- Game C – 5 players
- Game D – 10 players

The game room has 16 identical square tables. One person can sit on each side of the table.

1 Make a seating plan that shows a table arrangement so that each guest can play 1 of the games and all the tables are used.

2 Make a poster that includes:

- a seating chart
- an explanation about how you decided on your seating plan
- how many people can play games in the room with your seating plan

2

Game Night on a Graph

Make a scaled bar graph that shows the number of guests that can play each of the games A, B, C, and D.

Be sure to include:

- a title and other labels
- a scale that counts by a number other than 1

Name

Date

SECTION

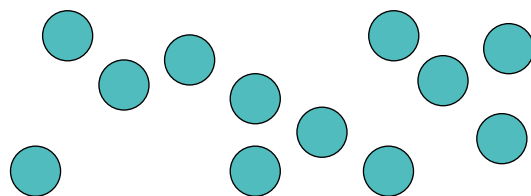
C

Practice Problems

1

from Unit 1, Lesson 17

Rearrange the circles to make an array in 2 different ways.



2

from Unit 1, Lesson 18

There are 4 rows of water bottles in the box. There are 5 bottles in each row.

a. Draw an array to represent the situation.

b. Write a multiplication expression to represent the number of bottles.

3

from Unit 1, Lesson 19

There are 5 rows of chairs in the room. There are 4 chairs in each row.
How many chairs are in the room?

- a. Write a multiplication equation to represent the situation.

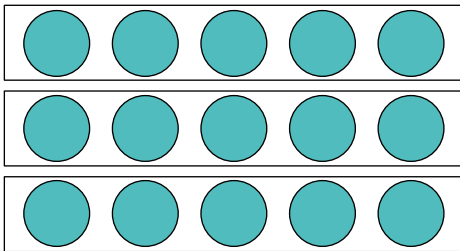
- b. Find the value that makes your equation true. _____

4

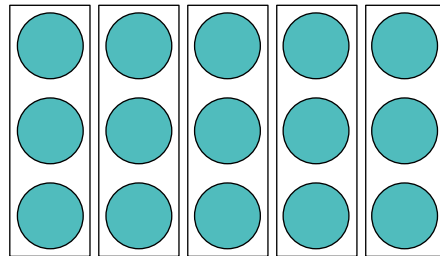
from Unit 1, Lesson 20

- a. Write a multiplication equation that represents each array.

A



B

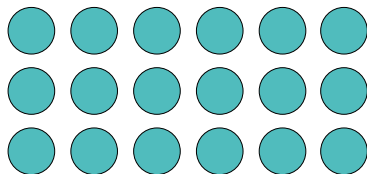


- b. How are the arrays alike? How are they different?

5

from Unit 1, Lesson 16

- a. Explain or show 2 different ways that you see equal groups in the array.



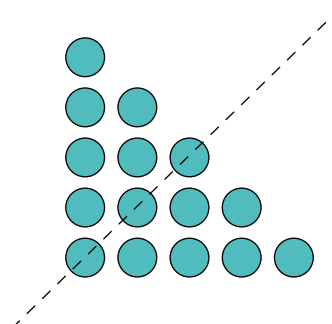
- b. Rearrange the dots to make a different array.

6

Exploration

Andre says that there are an odd number of circles in this picture.

Do you agree with Andre? Explain or show your reasoning.



7 Exploration

Find a collection of objects in the classroom or at home that is arranged in an array.

a. Describe the objects.

b. Create a drawing of the objects.

c. Write an equation showing how many objects there are.

array

An arrangement of objects in rows and columns. Each column must contain the same number of objects as the other columns, and each row must have the same number of objects as the other rows.

bar graph

A bar graph is an organized way to share data using the height or length of rectangles to show how many in each group or category.

equation

A statement that includes an equal sign (=). It tells us that what is on 1 side of the equal sign is equal to what is on the other side.

expression

A statement that has at least 2 numbers and at least 1 math operation (such as addition, subtraction, multiplication and division).

factor

A whole number that is multiplied by at least 1 other whole number to get a product.

key

The part of a picture graph that tells what each picture or symbol represents.

multiplication

An operation for finding the total number of objects when we have a certain number of equal groups.

picture graph

A way to show data using pictures or symbols to represent how many in each group or category.

product

The result of multiplying some numbers.

scaled bar graph

A bar graph marked in multiples of some number other than 1.

scaled picture graph

A picture graph where each picture represents an amount other than 1.

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