

Introducing Multiplication



Student Workbook



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Introducing Multiplication

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Introducing Multiplication Student Workbook

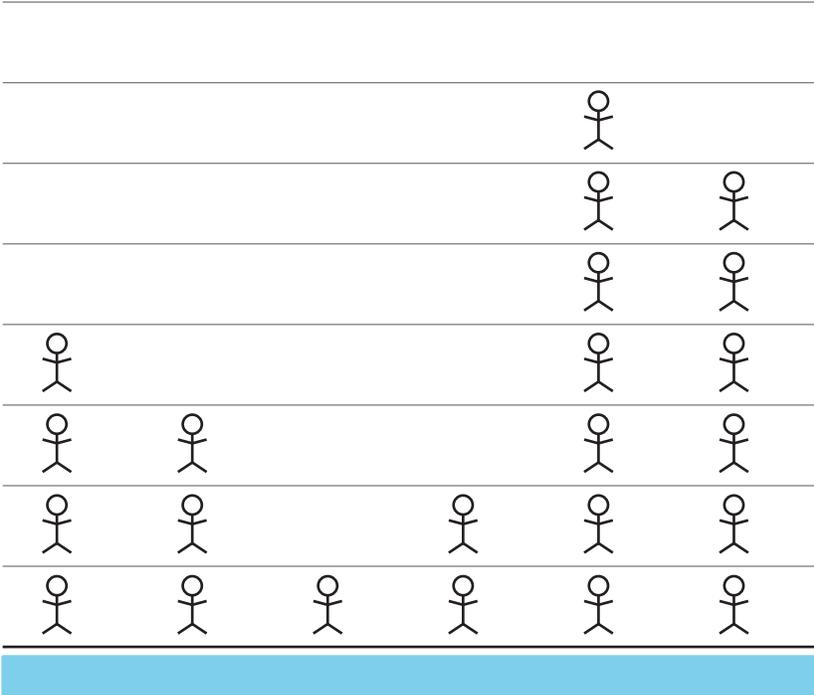
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Lesson 1: Make Sense of Data

- Let's read and ask questions about data.

Warm-up: Notice and Wonder: Graphs

What do you notice? What do you wonder?

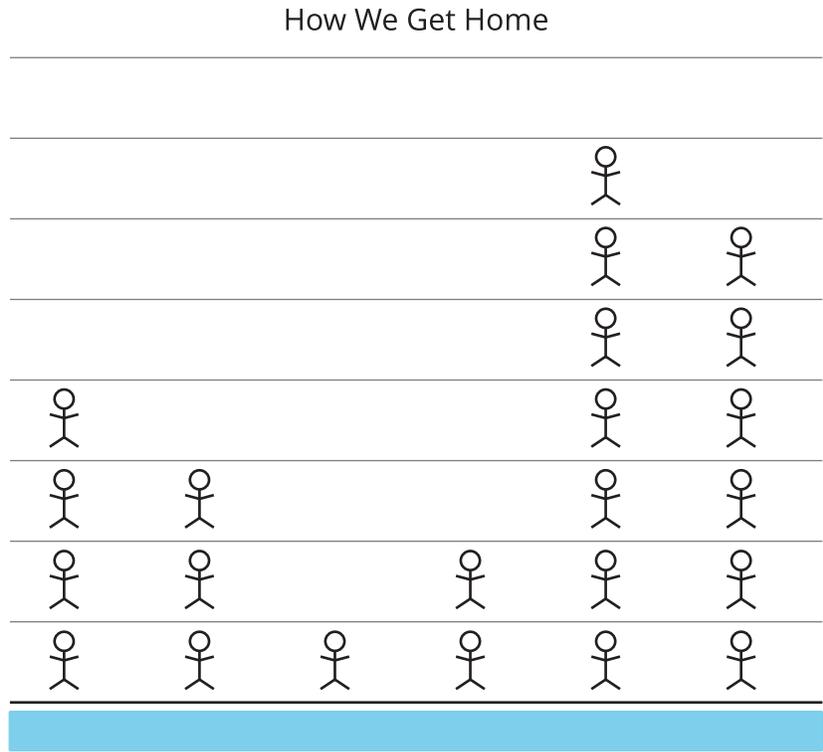


Each  represents 1 student.

1.1: Picture Time

What could the categories be for this picture graph?

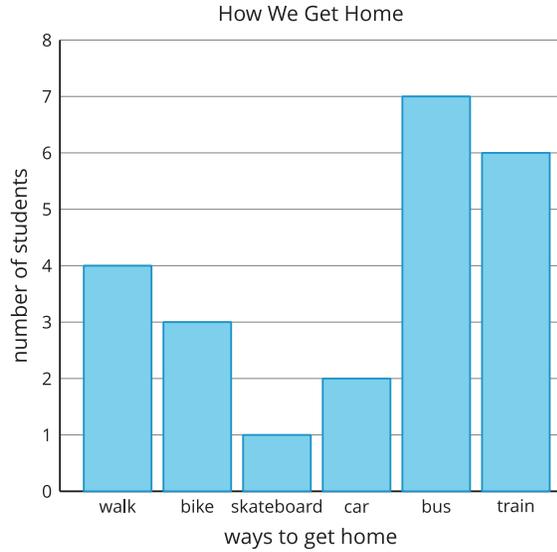
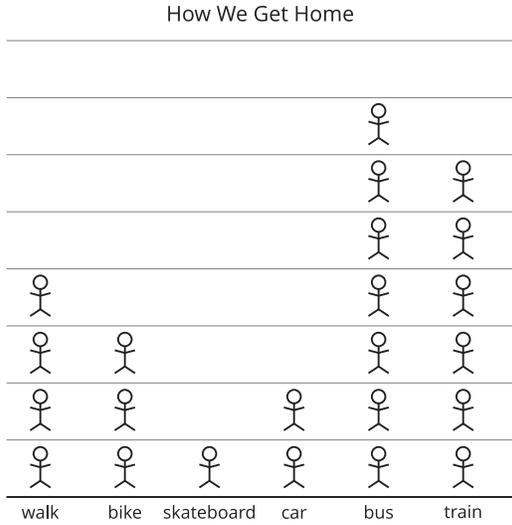
Be prepared to explain your reasoning.



Each  represents 1 student.

1.2: 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.



Each  represents 1 student.

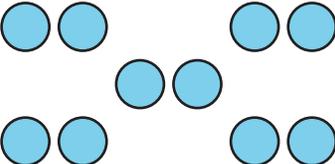
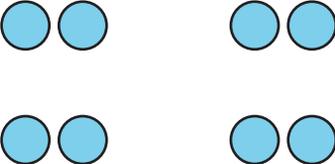
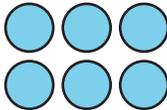
1. How are the graphs the same? How are they different?
2. What can we learn about how students get home based on the graphs?
3. Write two questions you could ask about how students get home based on the graphs.

Lesson 2: Represent Data and Solve Problems

- Let's create graphs and answer questions.

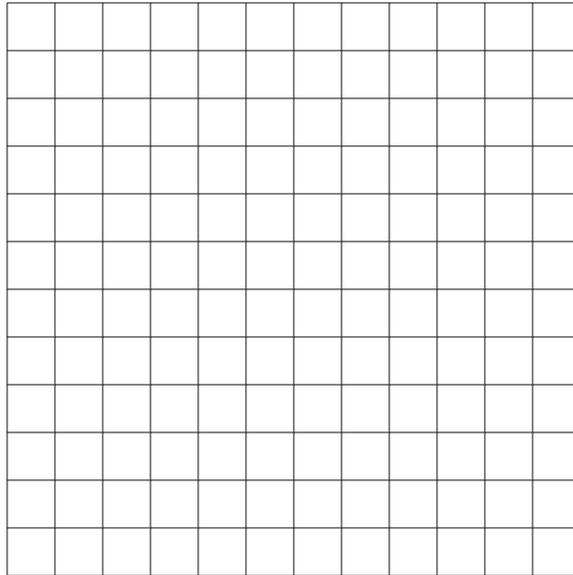
Warm-up: How Many Do You See: Dots in Groups

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



2.1: How We Get Home

1. Follow your teacher's instructions to organize and represent the class data in a picture graph.
2. Represent the same data that shows how our class gets home on a bar graph.



2.2: Questions About a Bar Graph

1. Decide if each statement is true or false about how our class gets home. 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 _____?"

Lesson 3: Scaled Picture Graphs

- Let's explore scaled picture graphs.

Warm-up: Number Talk: Addition

Find the value of each expression mentally.

- $50 + 10$

- $50 + 12$

- $60 + 13$

- $65 + 13$

3.1: So Many Responses

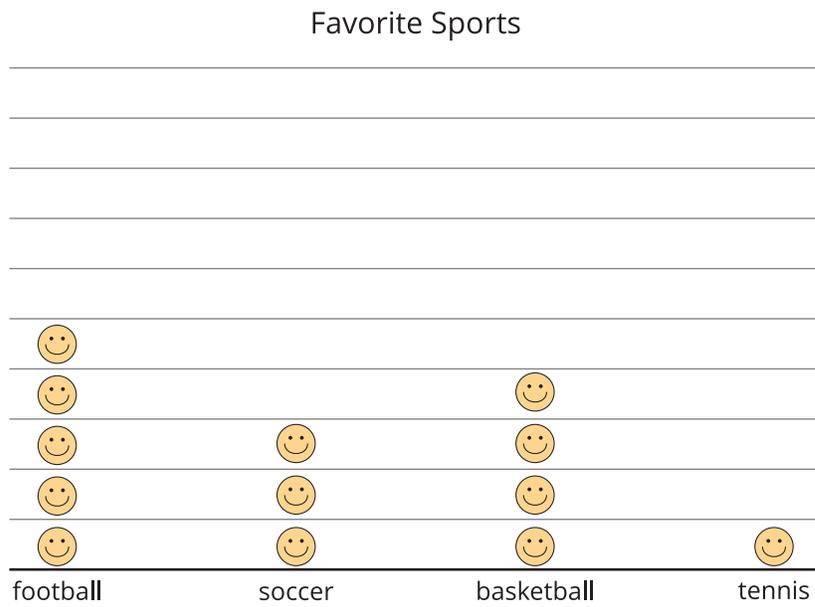
1. A group of students were asked, "What is your favorite sport?" Their responses are shown in this picture graph:



Each 😊 represents 1 student.

How many students are represented in the graph?

2. Their responses are also shown in this picture graph:

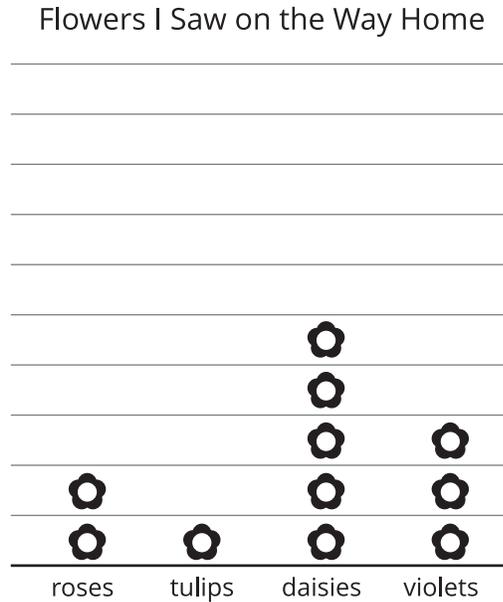


Each 😊 represents 5 students.

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

3.2: 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:



Each  represents 5 flowers.

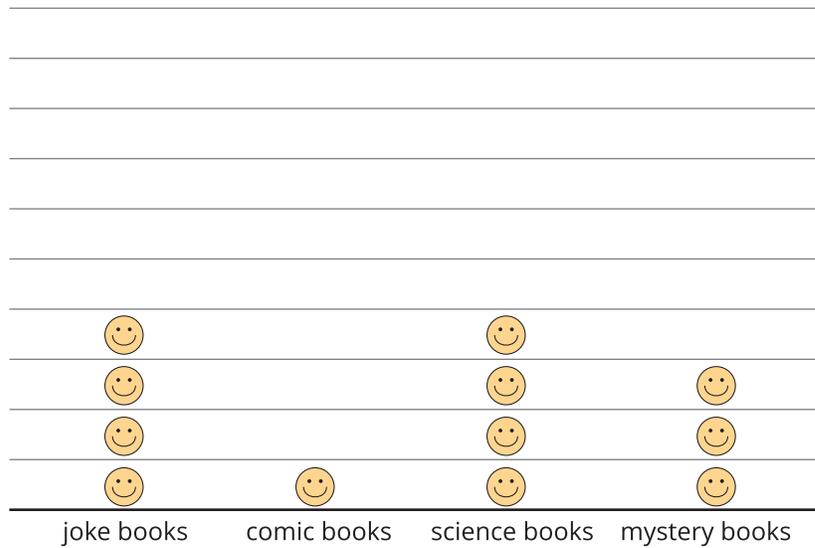
a. How many of each type of flower did Andre see on the way home?

roses ____ tulips ____ daisies ____ violets ____

b. Write 2 questions that you could ask about the flowers Andre saw on his way home.

2. A group of students were asked, "What 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 liked each type of book? How do you know?

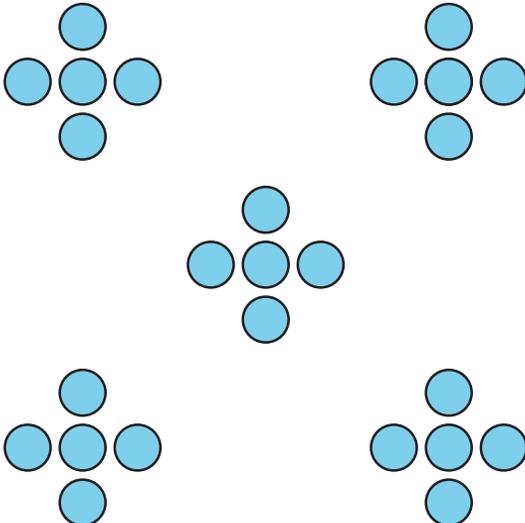
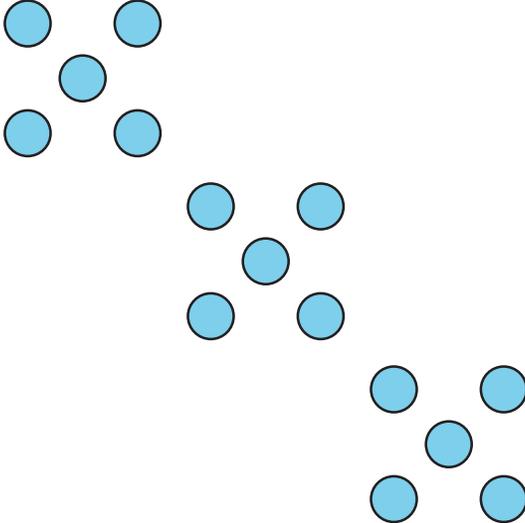
b. Write 2 questions that you could ask about students' favorite types of books based on the graph.

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?



4.1: Ways to Travel

How would you like to travel?

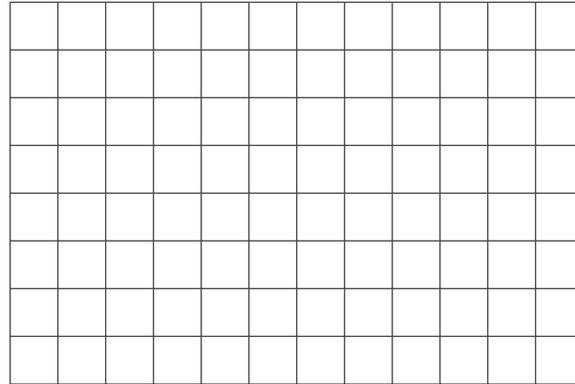
- car (C)
- train (T)
- boat (B)
- balloon (Bal)
- plane (P)
- helicopter (H)

student's name	way of traveling



4.2: Create a Scaled Picture Graph

Represent our survey data in a scaled picture graph where each picture represents 2 students.



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.

- $2 + 2 + 2 + 2$

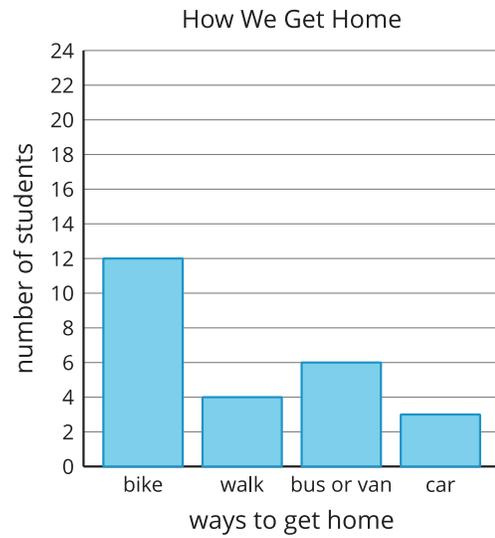
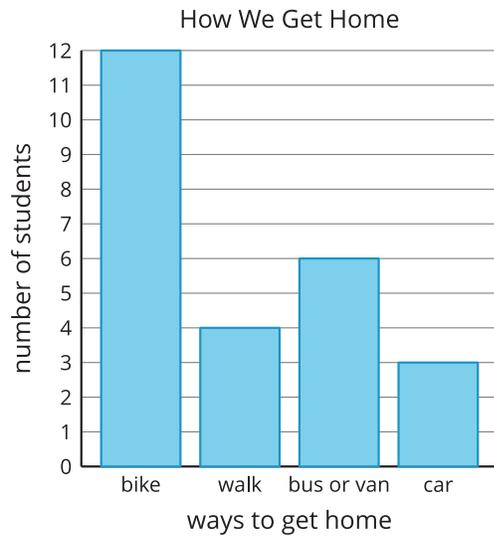
- $2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$

- $5 + 5 + 5 + 5$

- $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$

5.1: Compare Bar Graphs

A class was asked, "How do you get home from school?" Their responses are shown in these two bar graphs:

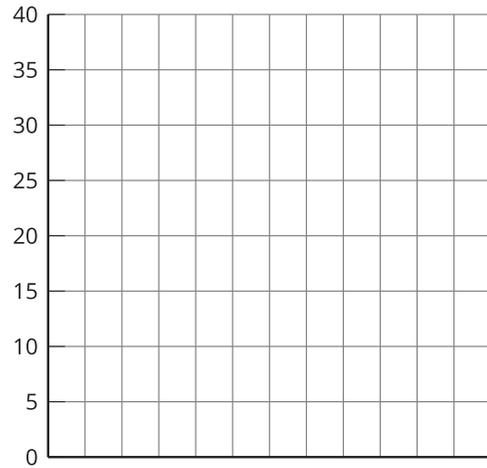
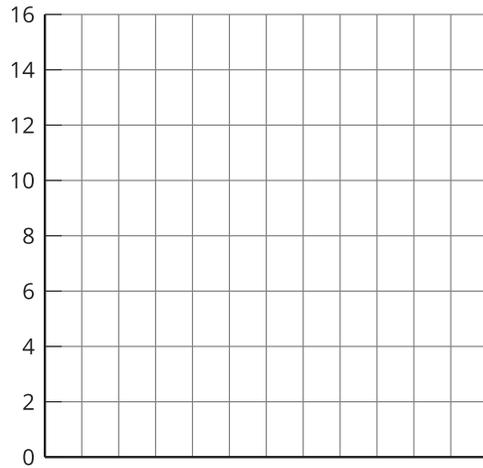


Discuss with your partner: How are the two graphs alike? How are they different?

5.2: Create a Scaled Bar Graph

Represent the data we collected earlier 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.

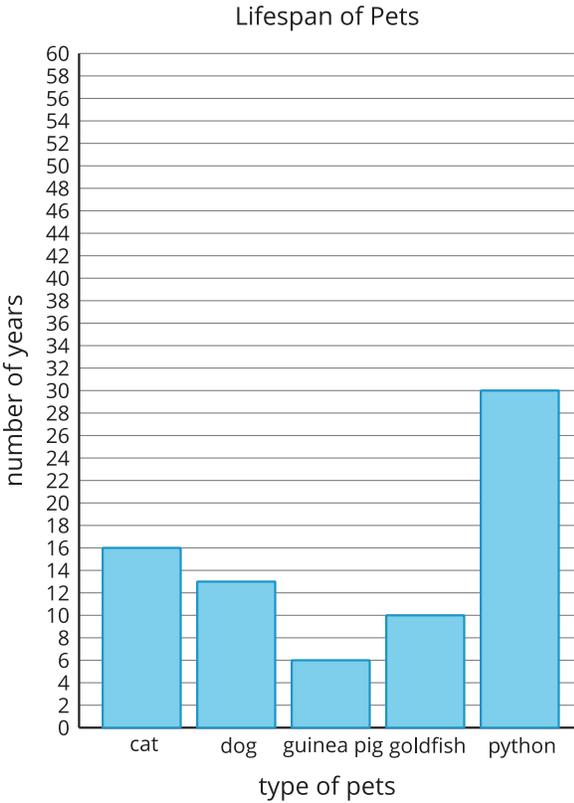
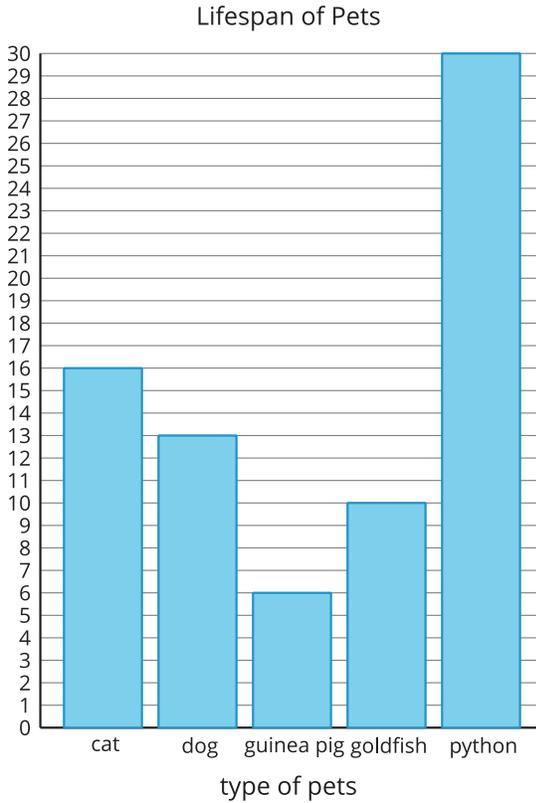


Lesson 6: Choose a Scale

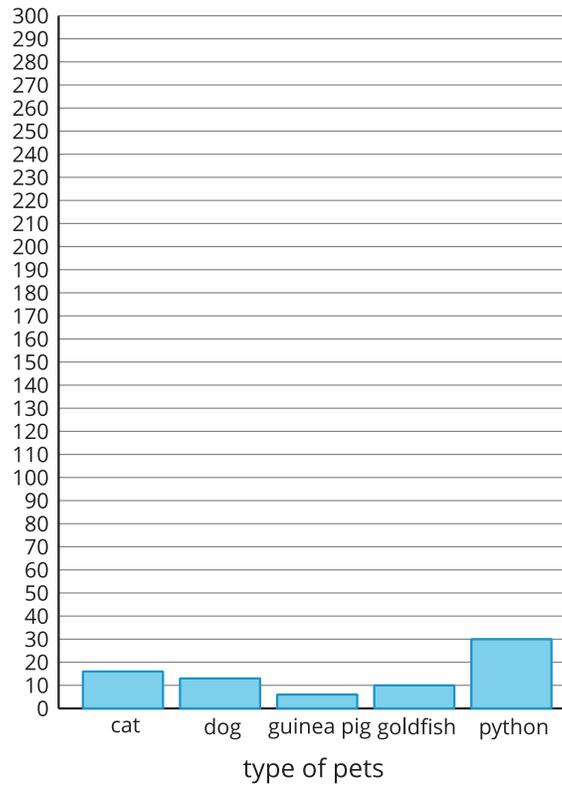
- Let's choose a scale for our bar graph.

Warm-up: Notice and Wonder: Bar Graph Scales

What do you notice? What do you wonder?

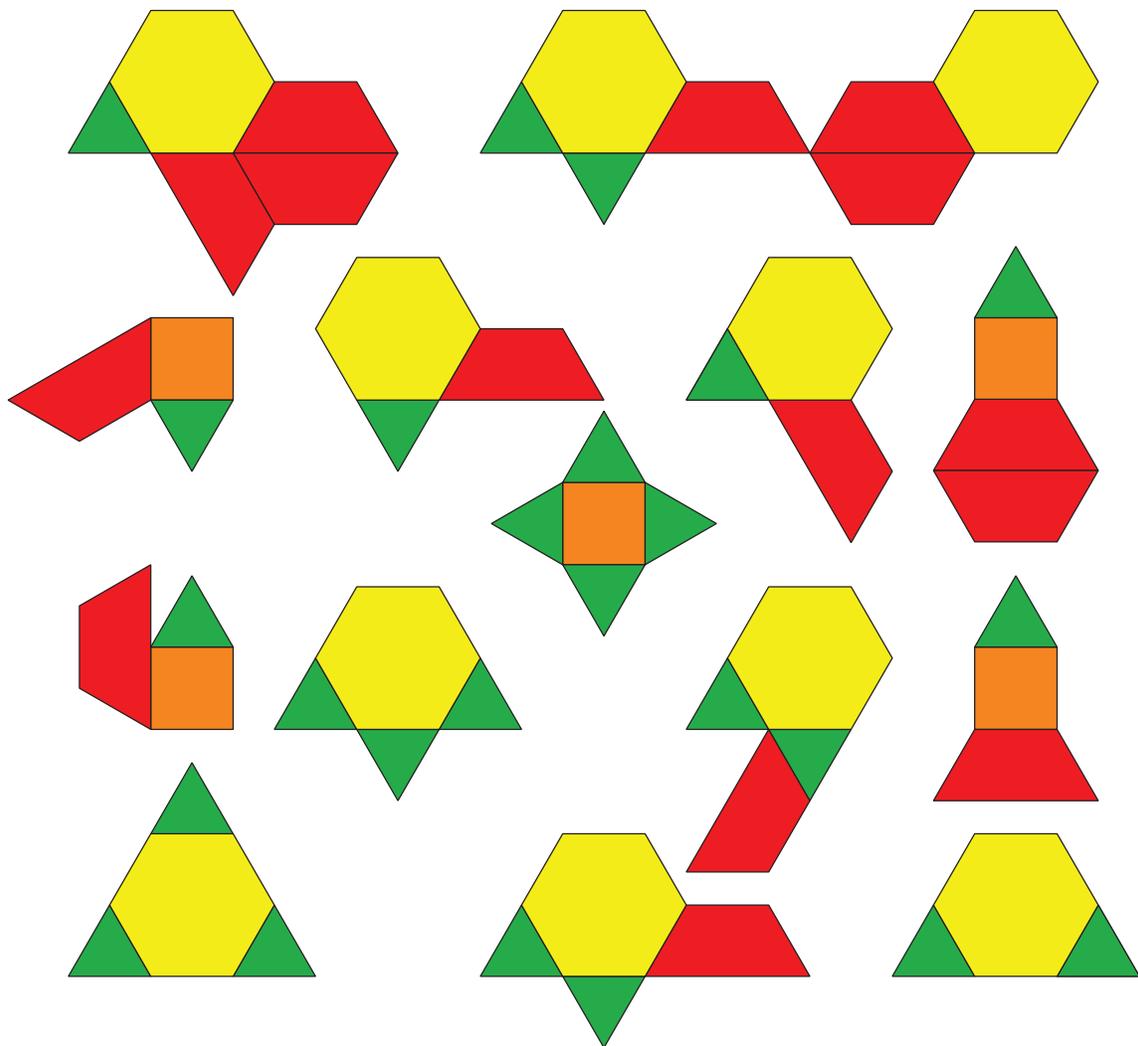


Lifespan of Pets



6.1: Represent Pattern Blocks

Here is a collection of pattern blocks.

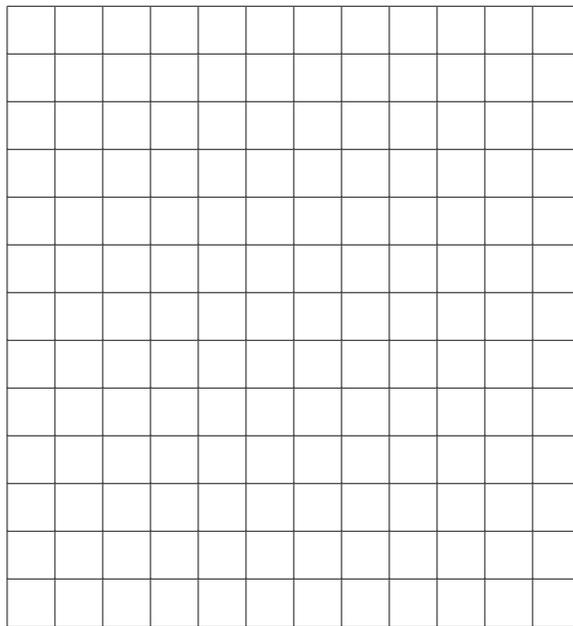


Mai, Noah, and Priya want to make a bar graph to represent the number of triangles, squares, trapezoids, and hexagons in the collection.

- 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 of pattern blocks.

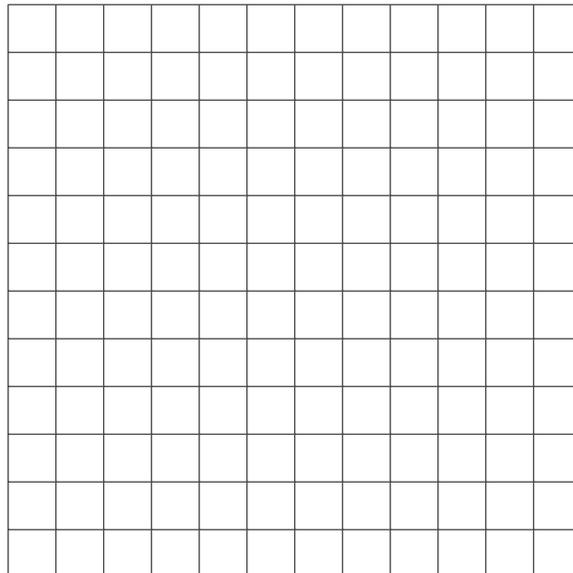


6.2: Represent More Data in a Scaled Bar Graph

All the third-grade students at school were asked, "What is your favorite time of the year?" Their responses are shown in this table:

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

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

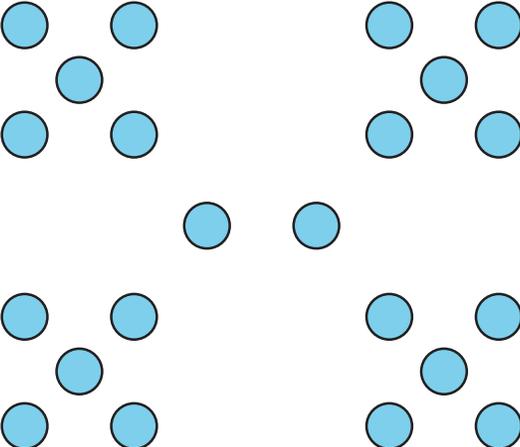
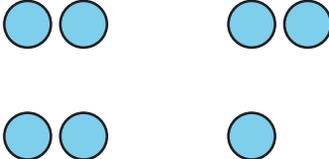


Lesson 7: Answer Questions about Scaled Bar Graphs

- 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?



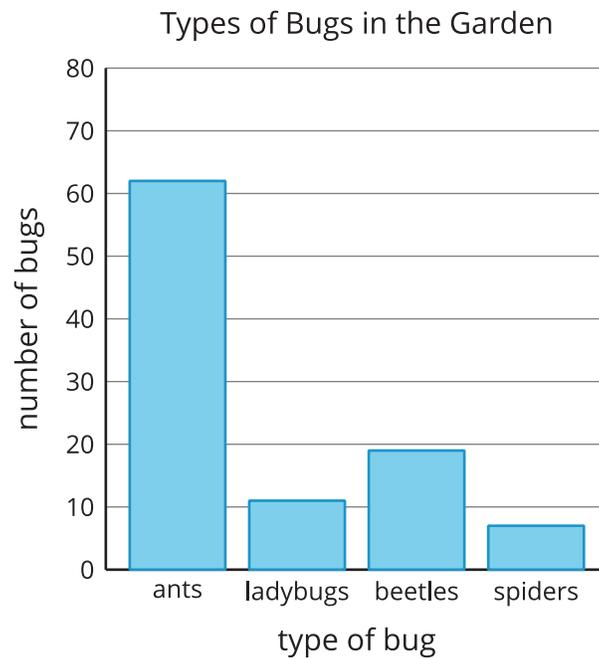
7.1: Questions about Favorite Time of the Year

Use your Favorite Time of the Year 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?

7.2: Questions About Bugs in the Garden

Data was collected to see how many of each type of bug 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 bugs were in the garden?
2. How many more ants were in the garden than spiders?
3. How many fewer ladybugs were there than ants?

4. Work with your partner to write 2 questions that could be asked about the bugs in the garden.

5. Trade with another group and answer each others' questions.



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.

- $2 + 2 + 2 + 2 + 2$

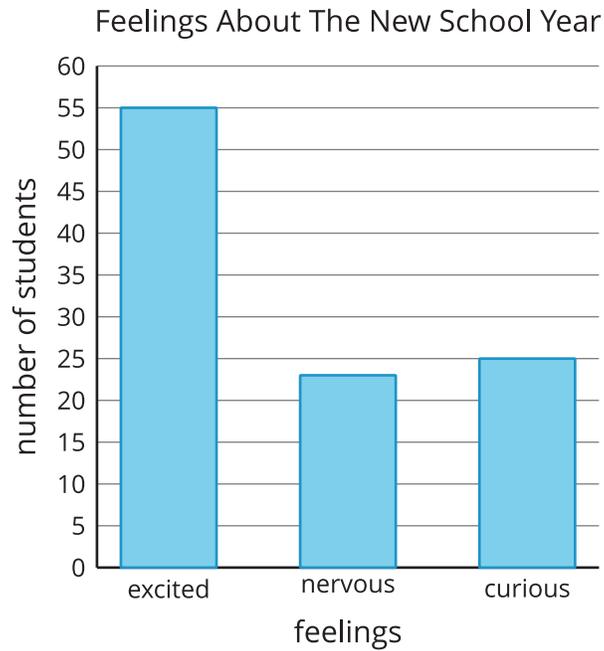
- $2 + 2 + 2 + 2 + 2 + 2$

- $5 + 5 + 5 + 5 + 5 + 5$

- $5 + 5 + 5 + 5 + 5 + 5 + 5$

8.1: New School Year

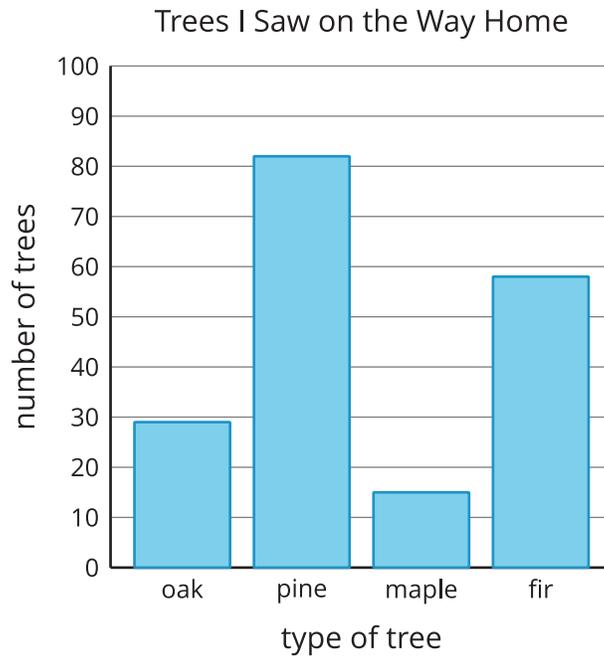
A group of students were asked, "How are you feeling about the new school year?" Their responses are shown in this bar graph:



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

8.2: 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.

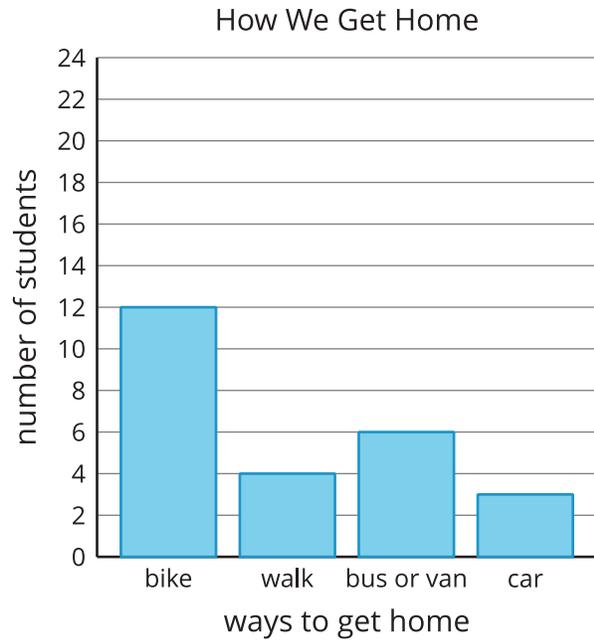
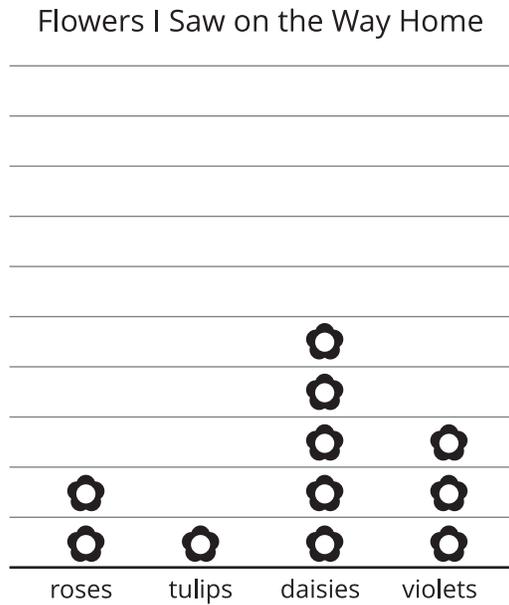


1. How many more pine trees did Clare see than fir trees?
2. How many more pine trees did Clare see than oak or maple trees?
3. How many fewer oak trees did Clare see than pine trees?
4. How many fewer maple or oak trees did Clare see than fir trees?

Section Summary

Section Summary

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



Each  represents 5 flowers.

We asked and answered questions that could be answered by 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?

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.

- $40 + 35$

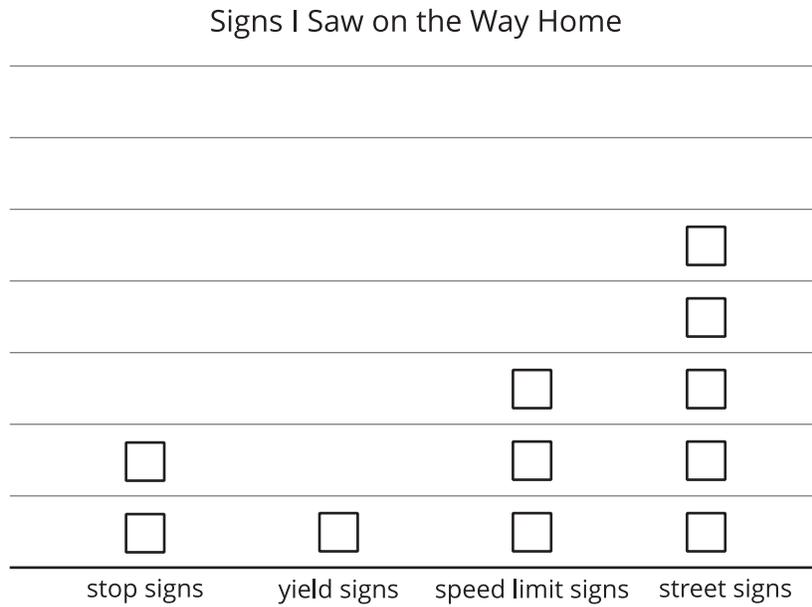
- $45 + 35$

- $45 + 36$

- $34 + 58$

9.1: From Scaled Graphs to Equal Groups

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



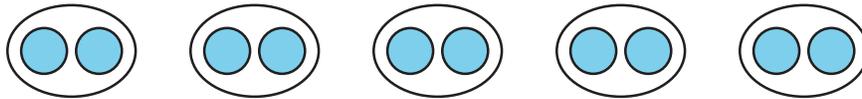
Each represents 2 signs.

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

2. Which statement describes 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?



9.2: Equal Group Situations

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.

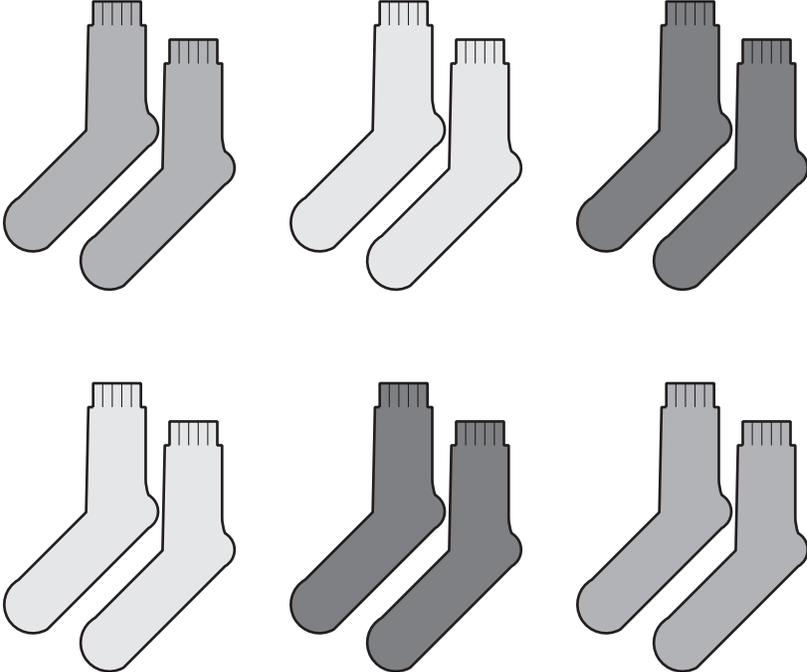
3. There are 3 basketball teams. Each team has 5 players.

Lesson 10: Drawings, Situations, and Diagrams, Oh My!

- Let's represent equal groups.

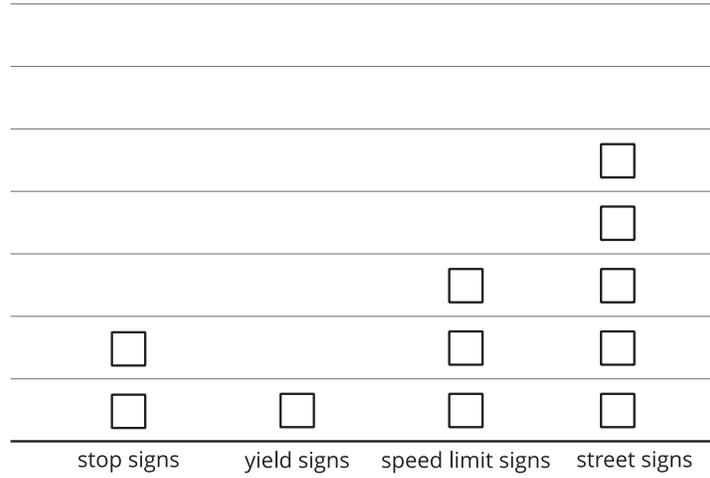
Warm-up: Notice and Wonder: Socks

What do you notice? What do you wonder?



10.1: Scaled Picture Graph to Diagram

Signs I Saw on the Way Home



Each represents 2 signs.

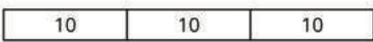
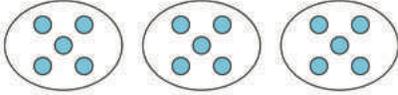
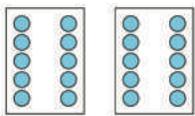
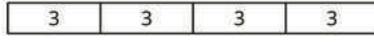
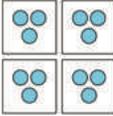
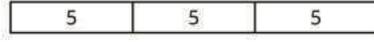


1. How does the diagram show the speed limit signs that Elena saw on the way home?

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

10.2: Card Sort: Equal Groups

1. Your teacher will give you a set of cards that show drawings, situations, and diagrams. Find the cards that match. Be ready to explain your reasoning.

<p>A</p> <p>There are 3 bags. Each bag has 5 footballs in it.</p>	<p>B</p> <p>Han has 4 boxes. Each box has 3 toy cars.</p>
<p>C</p> 	<p>D</p> <p>There are 2 boxes. Each box has 10 doughnuts.</p>
<p>E</p> 	<p>F</p> 
<p>G</p> 	<p>H</p> 
<p>I</p> 	<p>J</p> <p>Elena has 3 bins. Each bin has 10 ice cubes.</p>
<p>K</p> 	<p>L</p> 

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.

Lesson 11: Multiplication Expressions

- Let's write multiplication expressions.

11.1: Multiplication Expression Match



Your teacher will give you a card showing a drawing, a diagram, or a situation.

Match it to one of the expressions posted around the room. Be prepared to explain your reasoning.

11.2: Expressions to Drawings and Diagrams

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

a. 5×2

b. 3×4

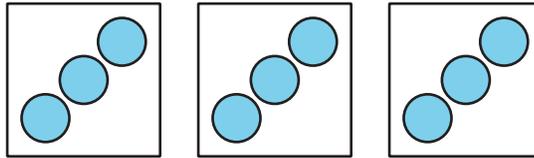
c. 3×10

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

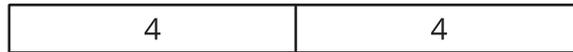
11.3: Write Multiplication Expressions

Write a multiplication expression to match each representation. Explain your reasoning.

1.



2.



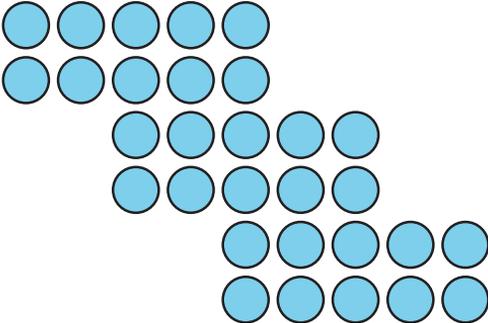
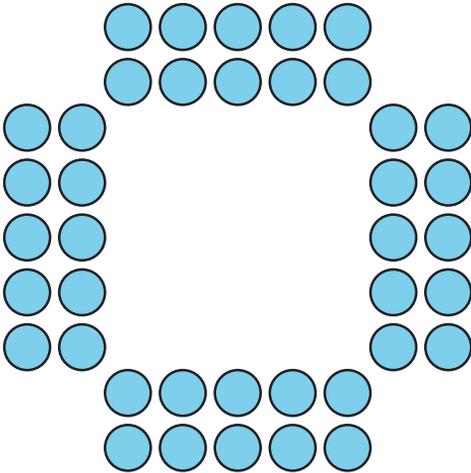
3. There were 2 packs of water. Each pack had 6 bottles of water.

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?



12.1: 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.



12.2: 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?

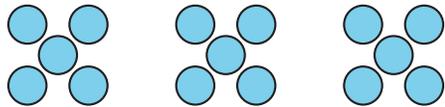
Lesson 13: Multiplication Equations

- Let's learn about multiplication equations.

Warm-up: Which One Doesn't Belong: Representations

Which one doesn't belong?

A



B

$$3 \times 5$$

C

$$2 \times 5 = 10$$

D

$$7 + 8 = 15$$

13.1: Multiplication Equation Match

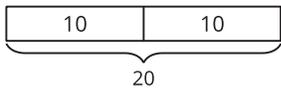
Find an equation from the list that can represent each situation, diagram, or drawing. Record the equation. Be prepared to explain your reasoning.

- $3 \times 5 = 15$
- $4 \times 10 = 40$
- $2 \times 10 = 20$

- $10 = 5 \times 2$
- $30 = 6 \times 5$
- $4 \times 2 = 8$

- $16 = 8 \times 2$
- $4 \times 5 = 20$
- $50 = 5 \times 10$

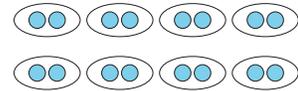
1.



2.

Andre had 5 pairs of socks.

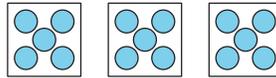
3.



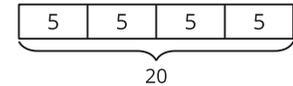
4.

6 hands were on the table. Each hand had 5 fingers.

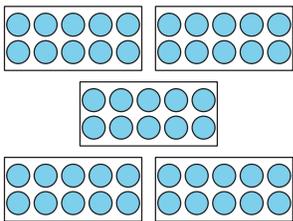
5.



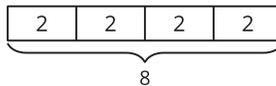
6.



7.



8.



9.

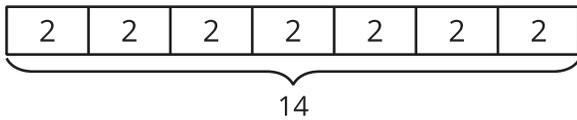
There were 4 boxes of markers. Each box had 10 markers.

13.2: Write Multiplication Equations

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

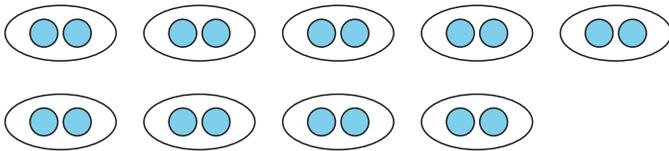
1. A package has 6 pairs of socks.

2.

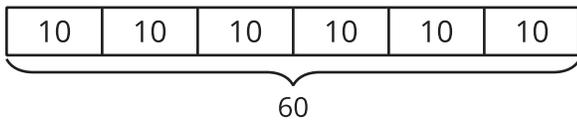


3. Diego has 7 sections in his notebook. Each section has 10 pages.

4.

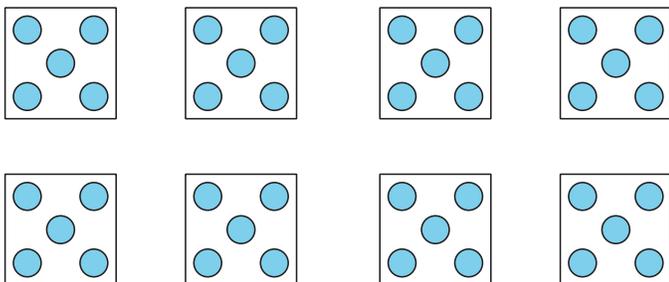


5.



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

7.



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.

- 1×5

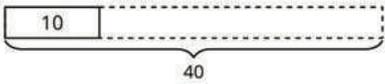
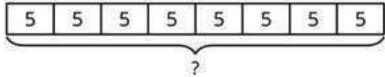
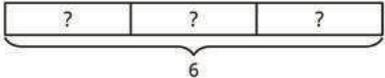
- 2×5

- 3×5

- 4×5

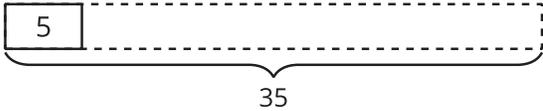
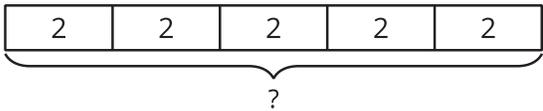
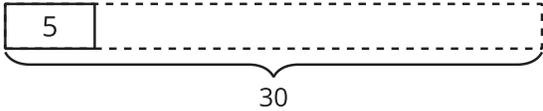
14.1: Card Sort: Unknown Numbers

Your teacher will give you a set of cards. Match each equation with a situation or diagram.

<p>Card Sort: Unknown Numbers A</p> $3 \times \underline{\quad} = 6$	<p>Card Sort: Unknown Numbers B</p> 
<p>Card Sort: Unknown Numbers C</p> $8 \times 5 = ?$	<p>Card Sort: Unknown Numbers D</p> <p>There are 5 boxes of crayons. Each box has 10 crayons in it.</p>
<p>Card Sort: Unknown Numbers E</p> 	<p>Card Sort: Unknown Numbers F</p> $5 \times 10 = ?$
<p>Card Sort: Unknown Numbers G</p> <p>There are 8 boxes and each box has some blankets in it. There are 16 blankets altogether.</p>	<p>Card Sort: Unknown Numbers H</p> $? \times 10 = 40$
<p>Card Sort: Unknown Numbers I</p> $? \times 5 = 25$	<p>Card Sort: Unknown Numbers J</p> <p>Han has some bags of peaches. Each bag has 5 peaches in it. Han has 25 peaches.</p>
<p>Card Sort: Unknown Numbers K</p> $8 \times \underline{\quad} = 16$	<p>Card Sort: Unknown Numbers L</p> 

14.2: Write Equations with an Unknown Number

- Write an 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>		

Lesson 15: More Factors, More Problems

- Let's solve more multiplication problems.

Warm-up: Number Talk: Tens

Find the value of each expression mentally.

- 1×10

- 2×10

- 3×10

- 4×10

15.1: Represent Situations with Equations

For each problem:

- Write an 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 plates. Han placed 5 plates on each table. How many tables have plates on them?

a. equation:

b. solution:

2. Lin made 6 sandwiches. She used 2 slices of bread for each sandwich. How many pieces of bread did she use?

a. equation:

b. solution:

3. Han has 60 ice cubes. The ice cubes are in trays of 10. How many trays of ice cubes does Han have?

a. equation:

b. solution:

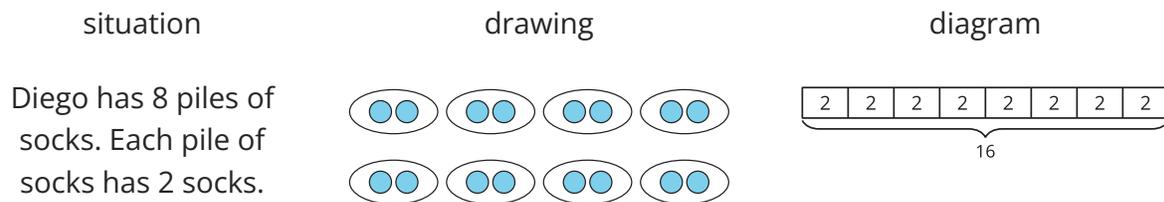
4. The store has 9 boxes. Each box has 5 shirts. How many shirts are there?

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

Section Summary

Section Summary

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



We wrote multiplication expressions and equations to represent equal groups.

expression

$$8 \times 2$$

equation

$$8 \times 2 = 16$$

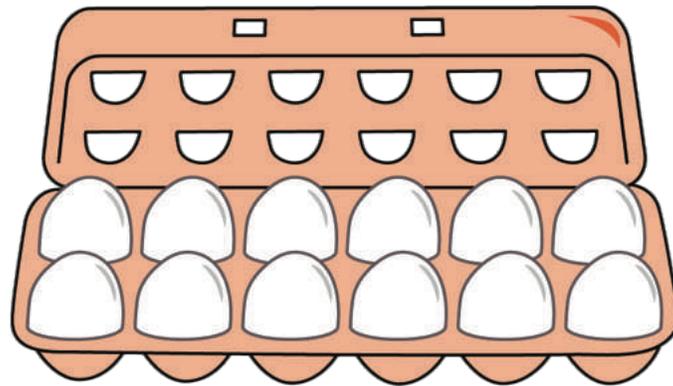
We learned that the numbers that are multiplied are called **factors** and the number that is the result of multiplying is called a **product**. In the equation $8 \times 2 = 16$, the numbers 8 and 2 are the factors and 16 is the product.

Lesson 16: Arrange Objects Into Arrays

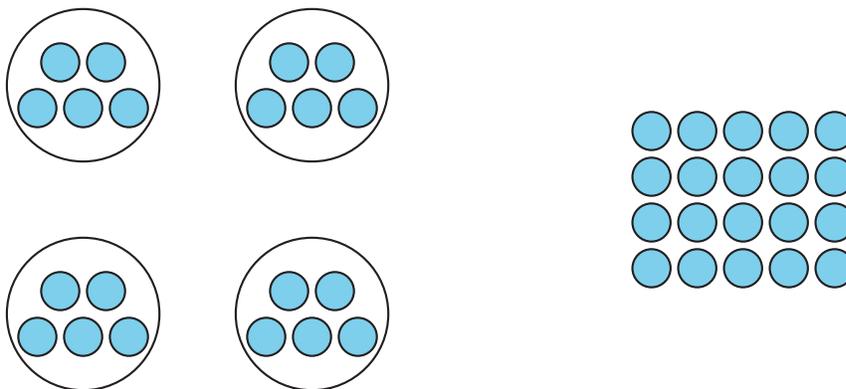
- Let's make some arrays.

Warm-up: Notice and Wonder: Eggs

What do you notice? What do you wonder?



16.1: Compare Equal Groups and Arrays



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.

16.2: 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.

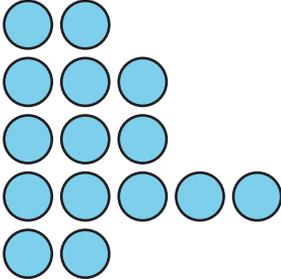
Lesson 17: Match and Draw Arrays

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

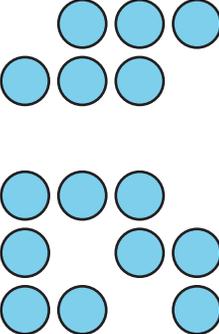
Warm-up: Which One Doesn't Belong: Arrangements

Which one doesn't belong?

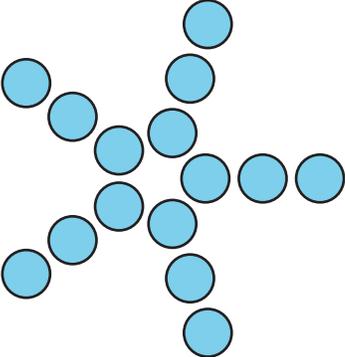
A



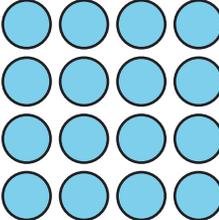
B



C

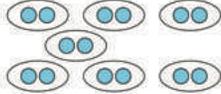
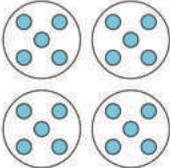
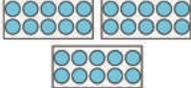
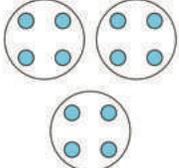
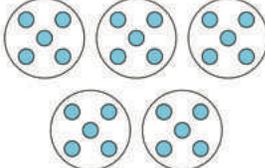
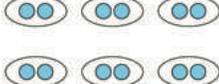


D



17.1: Card Sort: Arrays

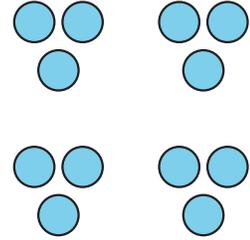
1. Match the drawings of equal groups and arrays that are alike. Be prepared to explain your reasoning.

<p>A</p> 	<p>B</p> 	<p>C</p> 
<p>D</p> 	<p>E</p> 	<p>F</p> 
<p>G</p> 	<p>H</p> 	<p>I</p> 
<p>J</p> 	<p>K</p> 	<p>L</p> 

2. Choose a match you and your partner made. Write down how you know the drawing matches the array.

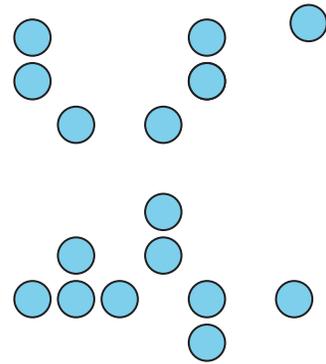
17.2: Draw Arrays

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.



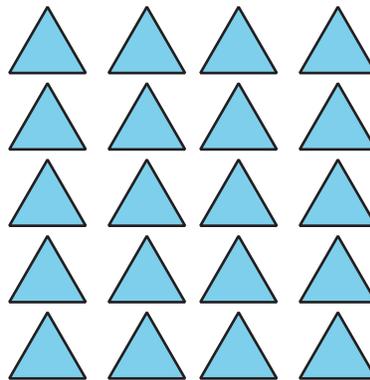
- b. Explain or show how each array is related to multiplication.

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?



18.2: Connect Arrays to Expressions

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

$$1.2 \times 3$$

$$2.5 \times 2$$

$$3.4 \times 4$$

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.

- 10×2

- 9×2

- 8×2

- 7×2

19.2: Tyler's Trees

For each problem:

- Write an 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. After learning about growing coconuts in Mexico, Tyler wants to plant coconut trees in his backyard in Florida. His mom will only let him plant 2 rows of 4 trees in his backyard.

How many trees will Tyler plant?



Lesson 20: The Commutative Property

- Let's learn about the commutative property.

Warm-up: Number Talk: Subtraction

Find the value of each expression mentally.

- $70 - 10$

- $68 - 10$

- $70 - 12$

- $68 - 12$

20.1: Learn More About Multiplication

What do you notice? What do you wonder?

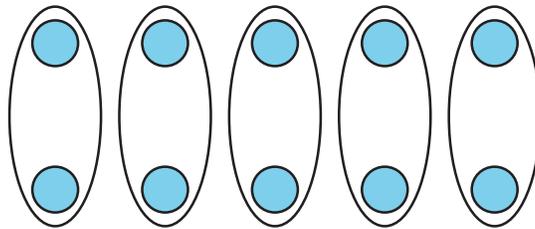
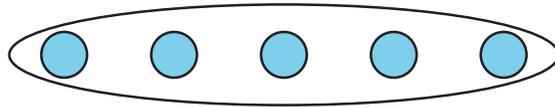
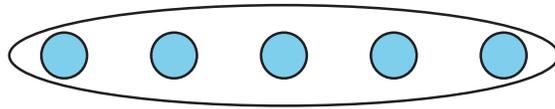


Image A

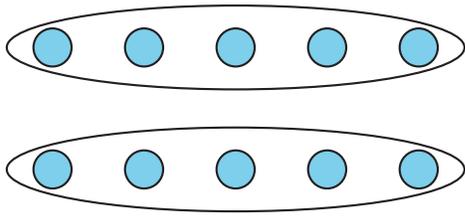
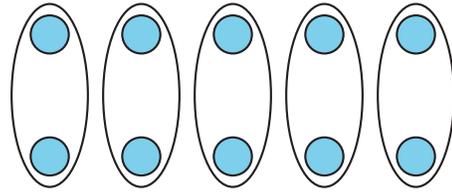


Image B



1. a. Write an array situation for each array.

Image A

Image B

- b. How are the situations the same? How are the situations different?

2. a. Write an equation for each situation.

Image A

Image B

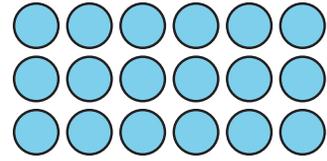
b. How does your equation connect to the situation and array?

Image A

Image B

20.2: Revisit Arrays

1. Write 2 multiplication equations that represent the array.

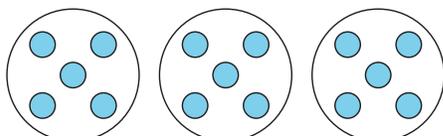
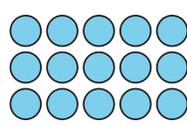


2. Explain why both equations can represent the array.

Section Summary

Section Summary

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

drawing of equal groups	array	expression
		3×5
		equation
		$3 \times 5 = 15$

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

$$3 \times 5 = 15$$

$$5 \times 3 = 15$$

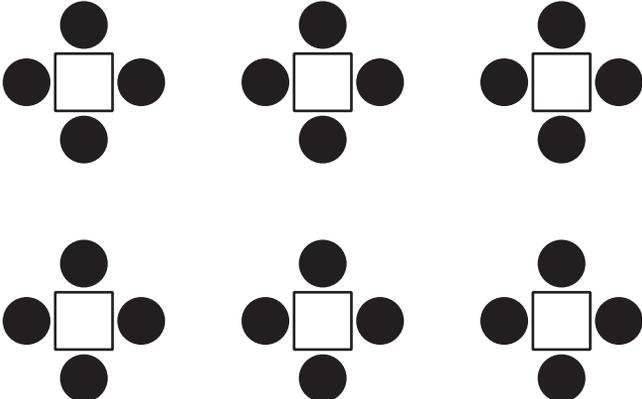
$$3 \times 5 = 5 \times 3$$

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?



21.1: Game Night

Your club is planning a game night.

Guests can play one of four 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, where one person can sit on each side.

1. Make a seating plan that shows the table arrangement so that each guest can play one of the games.

2. Make a poster that includes:

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

21.2: 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:

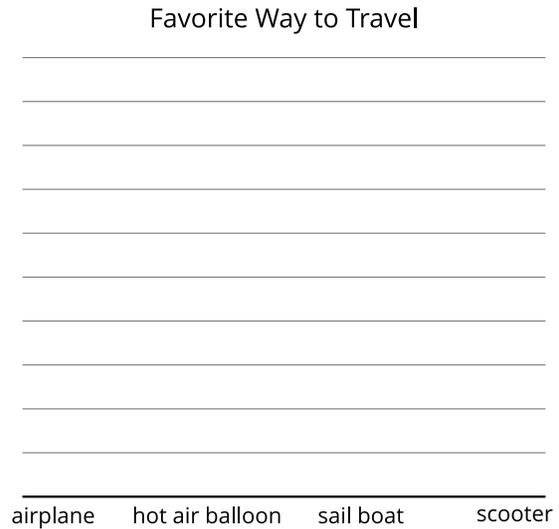
- a title and other labels
- a scale that counts by a number other than 1

Section A: Practice Problems

1. Pre-unit

The table shows how a group of students most enjoy traveling. 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

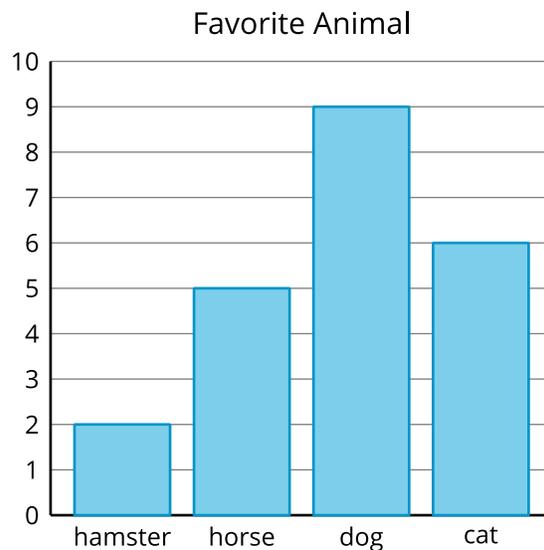


2. Pre-unit

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?



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.



4. Pre-unit

Find each sum or difference. Show your reasoning.

a. $25 + 62$

b. $37 - 9$

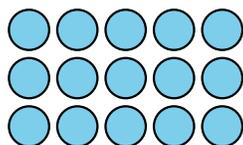
c. $24 + 47$

d. $84 - 59$

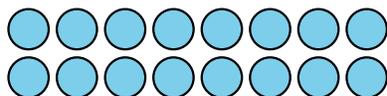
5. Pre-unit

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

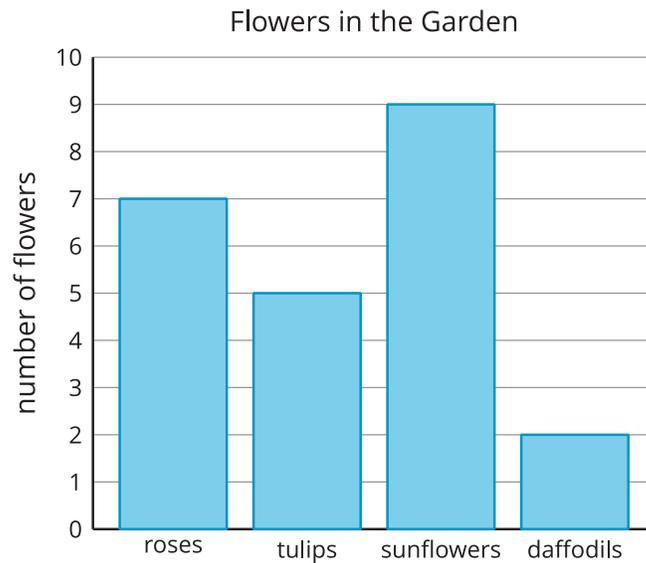
a.



b.



6. The graph shows some information about flowers in the garden.



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

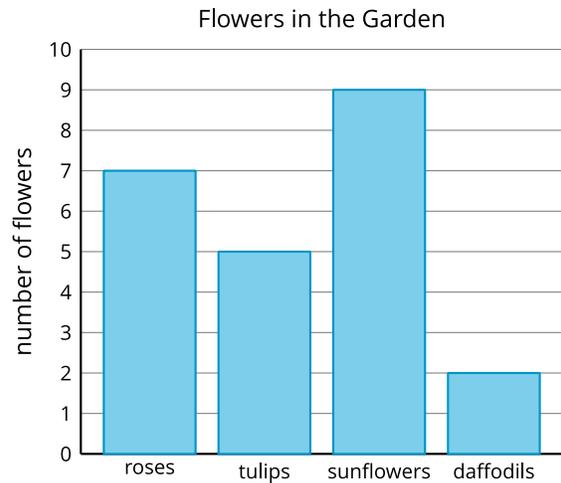
b. Write 2 questions you could answer about the data in the bar graph.

(From Unit 1, Lesson 1.)

7. 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 were there altogether?



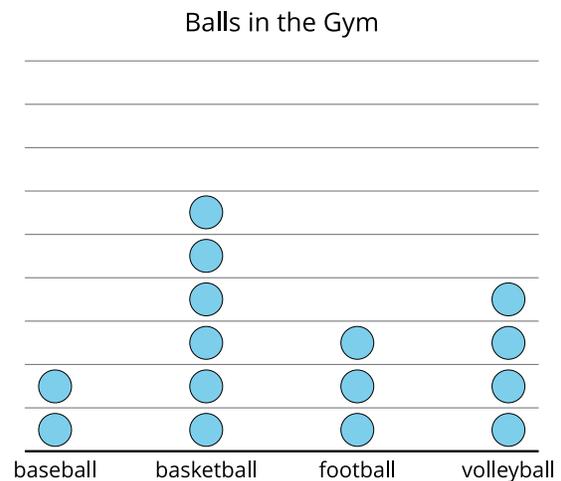
(From Unit 1, Lesson 2.)

8. This picture graph records types of balls in the gym. Use the graph to answer the questions.

a. How many basketballs are in the gym?

b. How many more basketballs are there than footballs?

c. Write one other question that you could answer about the balls in the gym using the graph.

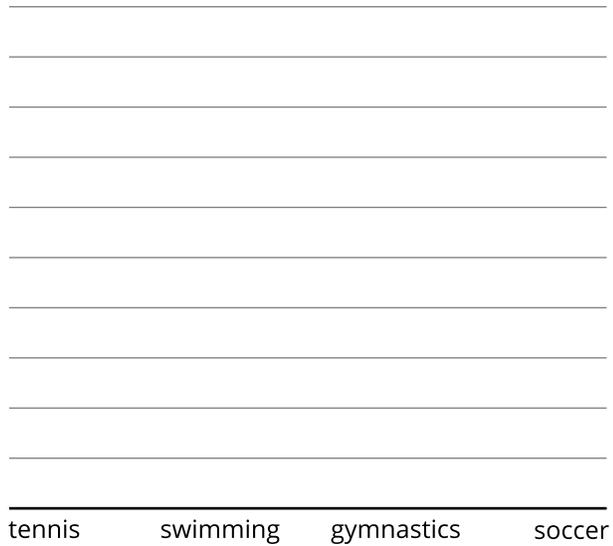


Each  represents 2 balls.

(From Unit 1, Lesson 3.)

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

sport	number
tennis	6
swimming	6
gymnastics	4
soccer	8

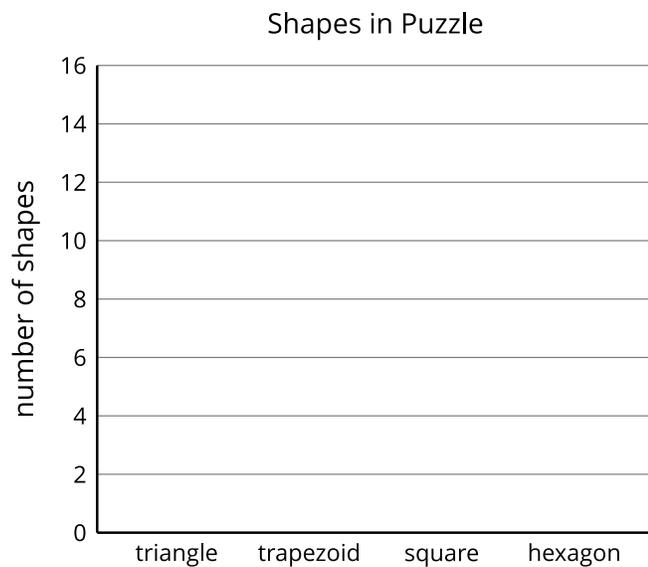


Each ● represents 2 people.

(From Unit 1, Lesson 4.)

10. The table shows the number 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



(From Unit 1, Lesson 5.)

11. The table shows the number of books some students have at home.

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

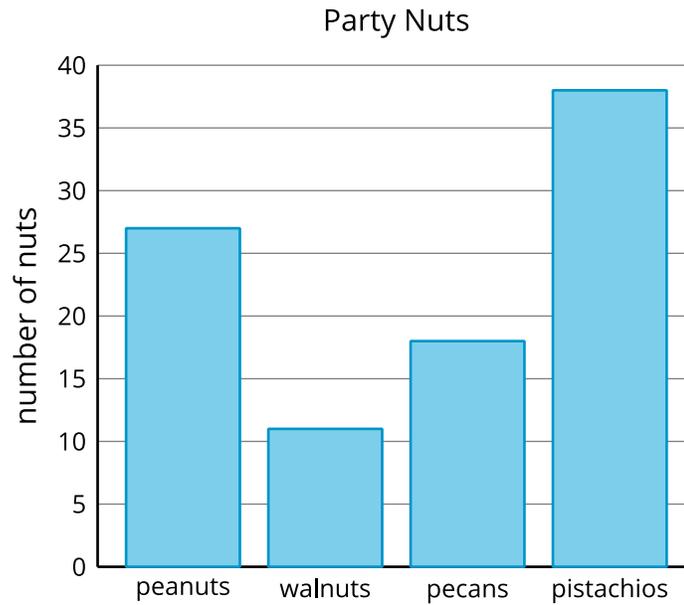
books	number
Elena	25
Andre	9
Tyler	16
Clare	21

Books at Home



(From Unit 1, Lesson 6.)

12. The graph shows the number of different kinds of nuts in a bowl.

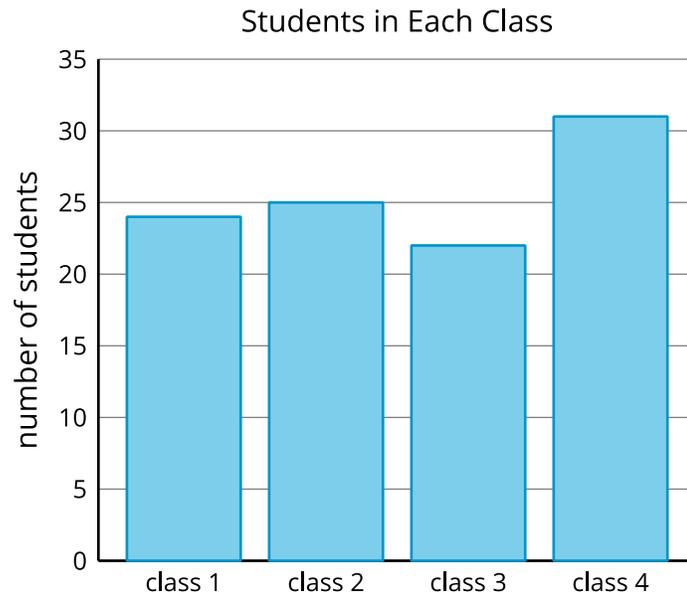


a. How many more pistachios are there than walnuts? Explain or show your reasoning.

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

(From Unit 1, Lesson 7.)

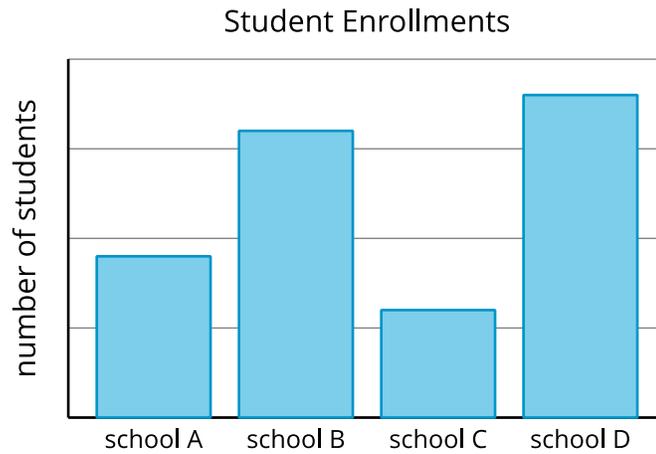
13. The scaled bar graph shows how many students are in each class.



- 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.

(From Unit 1, Lesson 8.)

14. **Exploration**



There are 1,000 students at the 4 schools. What is the approximate scale for the bar graph?

15. **Exploration**

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



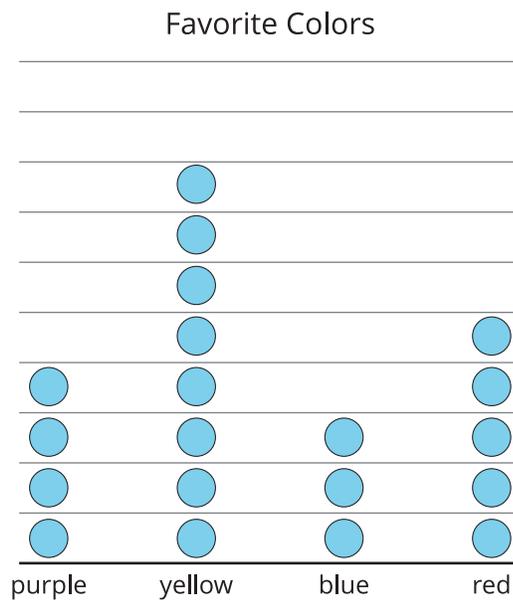
Section B: Practice Problems

- 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 out how many players are on the tennis courts. Explain or show your reasoning.

(From Unit 1, Lesson 9.)

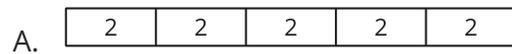
- The picture graph shows the favorite colors of some students.



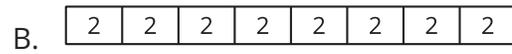
Each ● represents 2 people.

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

Introducing Multiplication



1. red

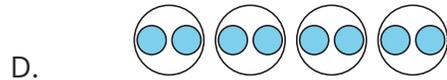


2. blue

3. purple



4. yellow



(From Unit 1, Lesson 10.)

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

(From Unit 1, Lesson 11.)

4. 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.

(From Unit 1, Lesson 12.)

5. 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?
- Write an equation with a symbol for the unknown to represent the situation.
 - Find the number that makes the equation true. Show your reasoning.

(From Unit 1, Lesson 13.)

6. Write an equation for the situation. Use a ? 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?

(From Unit 1, Lesson 14.)

7. Solve each problem. Explain or show your reasoning.

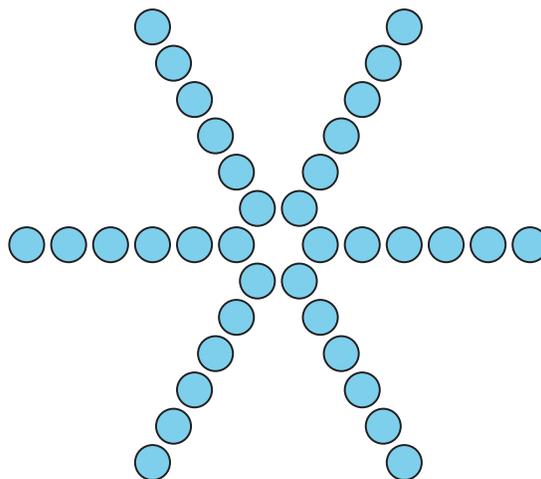
a. There are 6 flowers. Each flower has 5 petals. How many petals are there?

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

(From Unit 1, Lesson 15.)

8. Exploration

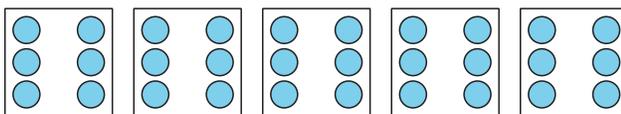
Write an expression for the number of circles in the image. Then, find the number of circles.



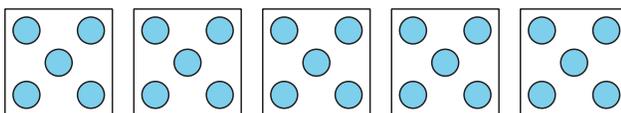
9. Exploration

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

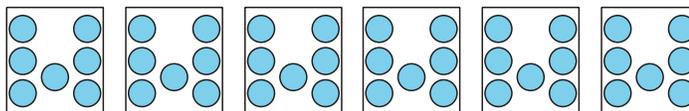
a.



b.



c.



10. Exploration

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

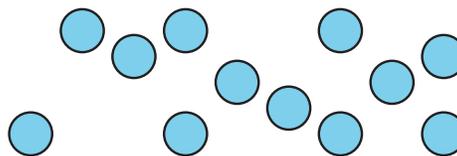
a. Describe the objects.

b. Create a drawing to represent the objects.

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

Section C: Practice Problems

1. Rearrange the circles to make an array in two different ways.



(From Unit 1, Lesson 17.)

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

Draw an array representing the situation. Then, write a multiplication expression representing the number of water bottles.

(From Unit 1, Lesson 18.)

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

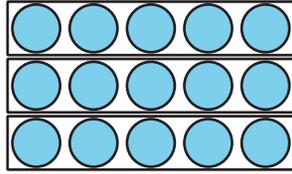
- a. Write a multiplication equation to represent the situation.

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

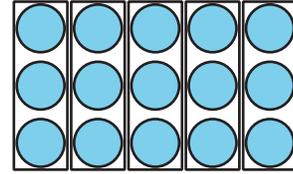
(From Unit 1, Lesson 19.)

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

A



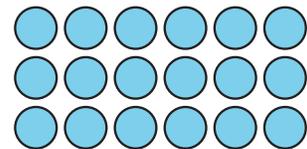
B



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

(From Unit 1, Lesson 20.)

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



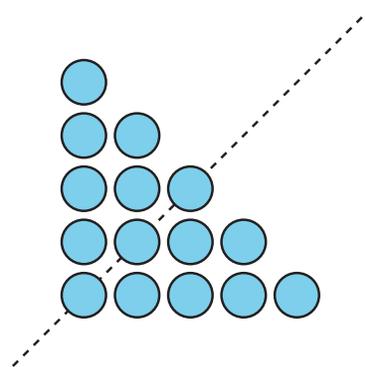
- b. Arrange the dots in an array in a different way.

(From Unit 1, Lesson 16.)

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.

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