Name: Answers

PDM3-4 Introduction to Pictographs

Gr. 3 Math
June 1–5

A pictograph uses symbols to show data.
On this pictograph, the symbol 🧍 means 1 student.
2 students eat lunch at home.
5 students eat lunch at school.

Lunch Location

At home	🧍🧍
At school	🧍🧍🧍🧍🧍

1. Use the pictograph to answer the question.

Number of Rainy Days

April	💧💧💧💧💧💧💧💧
May	💧💧💧💧💧
June	💧💧💧💧
July	💧💧💧
August	💧💧💧💧
September	

💧 = 1 day

a) How many rainy days were there in each month?

June 4 May 5 August 4

b) Which month had only 3 rainy days? July.

c) Which months had the same number of rainy days? June & August

d) How many more rainy days were there in April than in August? 4

e) June has 30 days. How many days were not rainy?

Write the subtraction equation. 30 − 24 = 6 not rainy days

f) September had 7 rainy days. Show this on the pictograph.

g) Which month had the most rainy days? April

h) Which month had the fewest rainy days? July

2. Use the pictograph to answer the questions.

a) **Lunch for Jay's Class** ☺ = 1 student

At school	☺☺☺☺☺☺☺
At home	☺☺☺☺☺☺☺☺☺☺☺

Do more students from Jay's class eat lunch at home or at school? At home How many more? 4

b) **Lunch for Kate's Class** ☺ = 1 student

At school	☺☺☺☺☺☺☺☺	8
At home	☺☺☺☺☺☺☺☺☺	9

Kate thinks more students eat lunch at school. Is she correct? No

c) Fix the pictograph in part b) so that it is easier to read.

Lunch for Kate's Class ☺ = 1 student

At school	○○○○○○○○
At home	○○○○○○○○○

Do more students from Kate's class eat lunch at home or at school? At home How many more? 1

d) Use the data from the pictographs in parts a) and c) to make a new graph.

Lunch at School ☺ = 1 student

Jay's class	○○○○○○○
Kate's class	○○○○○○○○

Do more students from Jay's class or Kate's class eat at school? Kate's class How many more? 1

3. Rob asked his friends to vote for their favourite sport.

a) Draw a circle for each student vote.

Favourite Sport	Number of Students
Baseball	5
Ice Hockey	6
Volleyball	3
Soccer	4

Students' Favourite Sports ○ = 1 student

Baseball	○	○	○	○	○	
Ice Hockey	○	○	○	○	○	○
Volleyball	○	○	○			
Soccer	○	○	○	○		

b) Which sport is the most popular? ice hockey

How can you see that from the pictograph? it has one more than any.

c) How many more students voted for baseball than for volleyball? 2

d) How many students in total voted for ball games? 12

BONUS ▶ How many more students voted for ball games than for ice hockey? 12 − 6 = (6)

4. Some students from Jane's class go to after-school programs.

a) Draw circles to show the data.

6 students go to art lessons.
3 more students go to soccer than to art lessons.
2 fewer students go to music lessons than to art lessons.

After-School Programs ○ = 1 student

Art	6	○	○	○	○	○	○				
Soccer	9	○	○	○	○	○	○	○	○	○	
Music	4	○	○	○	○						
No program	4	○	○	○	○						

b) There are 23 students in Jane's class. How many do not go to any after-school programs? Show this on the pictograph.

23 − 6 − 9 − 4 = (4)

PDM3-5 Pictographs

A **scale** shows what the symbol means on a pictograph.

10 students eat lunch at home and 20 students eat lunch at school. Both pictographs show the same data, but they use different scales.

Lunch Location

At home	♀
At school	♀ ♀

♀ = 10 students ← scale → ♀ = 5 students

Lunch Location

At home	♀ ♀
At school	♀ ♀ ♀ ♀

1. Look at the scale and multiply to find what each group of symbols means.

   a) ♀ = 5 people

   ♀♀♀ = 15 people

   ♀♀♀♀♀ (5, 10, 15, 20, 25) = 25 people

   b) ✿ = 2 flowers

   ✿✿ = 4 flowers

   ✿✿✿✿ (2, 4, 6, 8) = 8 flowers

   ✿✿✿✿✿✿✿ = 14 flowers

   c) □ = 3 boxes

   □□□ (3, 6, 9) = 9 boxes

   □□□□□ (3, 6, 9, 12, 15) = 15 boxes

   □□□□□□ (3, 6, 9, 12, 15, 18) = 18 boxes

   □□□□□□□□□ (3, 6, 9, 12, 15, 18, 21, 24, 27) = 27 boxes

   BONUS ▶ If ☺ = 20 people, how many people is ☺☺☺☺☺ (20, 40, 60, 80, 100)? 100

2. Look at the scale and draw symbols to show each number.

   a) □ = 4 boxes

   12 boxes = □□□

   8 boxes = □□ (4, 8)

   b) □ = 5 boxes

   15 boxes = □□□ (5, 10, 15)

   30 boxes = □□□□□□ (5, 10, 15, 20, 25, 30)

3. a) Use the pictograph to fill in the table.

Flowers in Evan's Garden ♡ = 2 flowers

Roses	♡ ♡ ♡ ♡
Pansies	♡ ♡
Marigolds	♡ ♡ ♡ ♡ ♡ ♡

Type of Flower	Number of Flowers
Roses	8
Pansies	4
Marigolds	12

b) Use the data in part a) to draw a pictograph with the new scale.

Flowers in Evan's Garden ♡ = 4 flowers

Roses	♡4	♡8			
Pansies	♡4				
Marigolds	♡4	♡8	♡12		

c) How many more marigolds than pansies does Evan have? 8

d) How many flowers does Evan have in total? 24

Half a symbol means half the number. Example: If ☺ = 4, then ☹ = 4 ÷ 2 = 2.

4. The first row shows what ☺ means. What does ☹ mean? Fill in the table.

☺	10	2	6	20	14	12	200
☹	5	1	3	10	7	6	100

If ☺ = 10, then ☺☺☺ = 3 × 10 = 30, and ☺☺☺☹ = 30 + 5 = 35.

5. The first row shows what one symbol means. What does each group of symbols mean?

a)

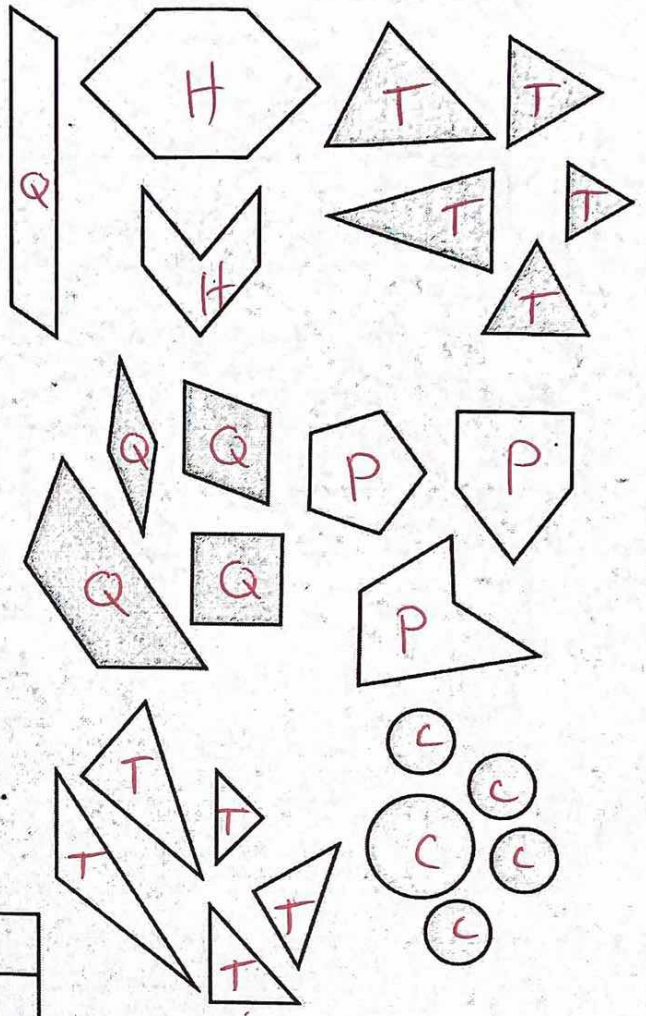
☆	6	2	10
☆☆	12	4	20
☾	3	1	5
☆☆☾	15	5	25

b)

웃	2	4	10
웃웃웃웃	8	16	40
웃	1	2	5
웃웃웃웃웃	9	18	45

PDM3-6 Creating Pictographs

1. a) There are 25 shapes in the picture. Count the number of each shape.



Shape	Number of Shapes
Triangle	10
(4 sides) Quadrilateral	5
(5 sides) Pentagon	~~4~~ 3
(6 sides) Hexagon	2
Circle	5

b) Choose a symbol for your pictograph. Make sure it is easy to draw half a symbol.

○ C

c) Draw a pictograph using your symbol. Remember to fill in the scale.

Shapes in the Picture

Triangle	○	○	○	○	○	
Quadrilateral	○	○	C			
Pentagon	○	C				
Hexagon	○					
Circle	○	○	C			

* ○ = 2 shapes

d) What is the most common shape in the picture? triangles

What is the least common shape in the picture? hexagon

e) Polygons have straight sides.
How many polygons are in the picture? 20

f) How many more polygons than circles are in the picture? 20 − 5 = 15

2. The first line shows the data. Circle the best scale for the data.

a) 12, 6, 8

☆ = 2

☆ = 5

☆ = 10

b) 30, 20, 40

☆ = 2

☆ = 3

☆ = 10

c) 9, 12, 6

☆ = 3

☆ = 5

☆ = 10

d) 25, 10, 35

☆ = 2

☆ = 3

☆ = 5

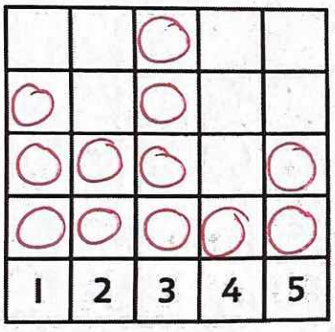
REMINDER ▶ The mode is the most common data value.
In the set 3, 3, 4, 4, 4, 5, 5, 6, the mode is 4.

3. Lily counted the students in each grade at camp.

Draw a pictograph for the given scale.

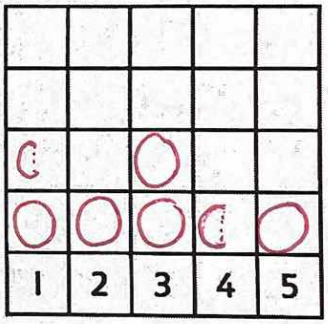
Grade	1	2	3	4	5
Number of Students	15	10	20	5	10

a) ☺ = 5 students



Grade

b) ☺ = 10 students



Grade

mode = 10

c) What is the mode? How can you find the mode from a pictograph? Answer

4. Use the pictograph to answer the questions.

a) How many more students visited Vancouver than Ottawa? 10

b) Fewer students visited Calgary than Ottawa. How many fewer? 25 = (30 - 5)

c) 15 more students visited Toronto than Winnipeg. Show this on the pictograph.

35 - 15 = 20

Cities Visited by Students

Calgary, AB	☺ 5
Toronto, ON	☺☺☺☺ 35
Ottawa, ON	☺☺☺ 30
Vancouver, BC	☺☺☺☺ 40
Winnipeg, MB	☺☺ 0

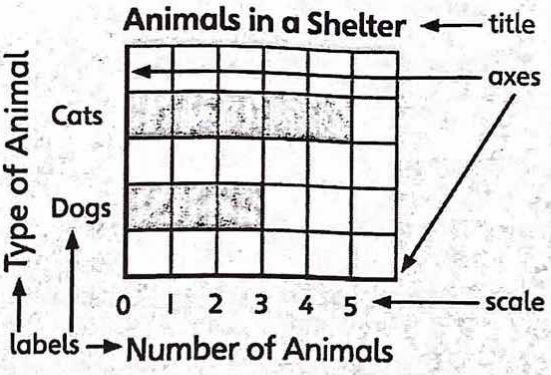
☺ = 10 students

PDM3-7 Introduction to Bar Graphs

A **bar graph** uses **bars** to show data.

Each bar graph has a **title**, **labels**, two **axes**, and a **scale**.

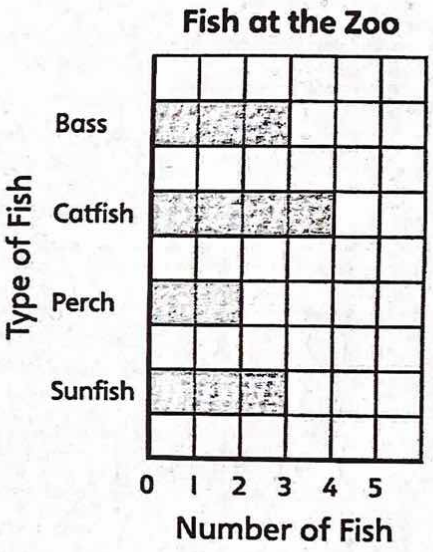
This bar graph shows that there are 5 cats and 3 dogs in a shelter.



1. The bar graph shows fish at the zoo.

   a) Use the bar graph to fill in the table.

Type of Fish	Number of Fish
Bass	3
Catfish	4
Perch	2
Sunfish	3

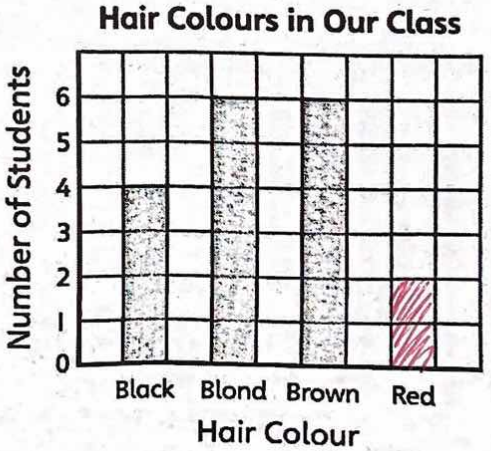


   b) What is the most common fish? catfish

   c) What is the least common fish? perch

   d) How many fish are at the zoo in total? 12

2. Use the bar graph to answer the questions.



   a) How many students have black hair? 4

   b) How many students have blond hair? 6

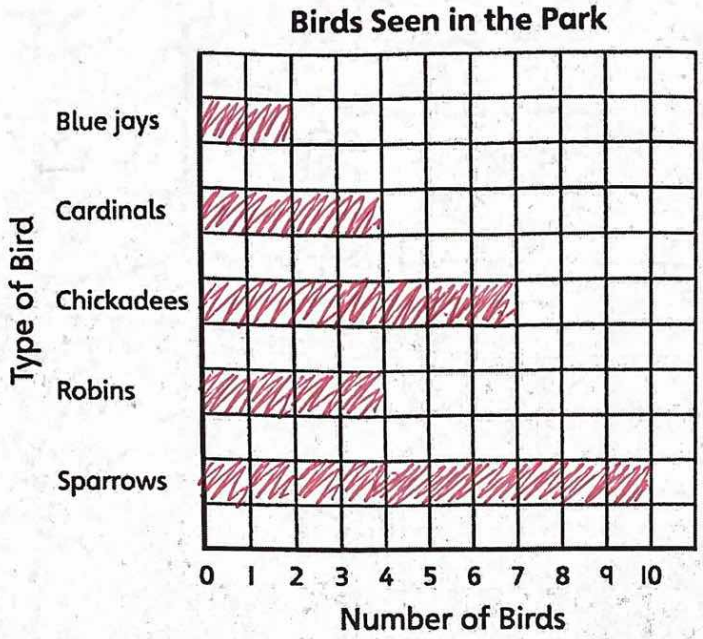
   c) 2 students have red hair. Draw a bar for them.

   d) How many students do not have black hair? 14

   e) How many students are in the class? 18

3. Arsham counted birds he saw in the park.

a) Use the table to complete the bar graph.



Type of Bird	Number of Birds
Blue jays	2
Cardinals	4
Chickadees	7
Robins	4
Sparrows	10

b) What was the most common bird seen in the park? Sparrows

How does the bar graph show it? longest line

c) How many more sparrows than robins did Arsham see? 6

d) How many birds did Arsham see in total? 27

e) A blue jay has a mass of about 85 g. How much did the blue jays that Arsham saw weigh altogether? 170 g

$$\begin{array}{r} {}^{1} \\ 85 \\ +85 \\ \hline 170 \end{array}$$ g

f) A sparrow has a mass of about 20 g. What weighs more, all the sparrows that Arsham saw or all the blue jays he saw?

$10 \times 20 = 200$ g *All sparrows together

g) A chickadee has a mass of about 10 g. Do all the chickadees Arsham saw weigh more altogether than one blue jay? 70 g. No

h) A cardinal has a mass of about 45 g. Use doubling to find the mass of all the cardinals Arsham saw. 180 g

i) A robin has a mass of about 80 g. How much do all the robins that Arsham saw weigh altogether? ~~RAND~~ 320 g

BONUS ▶ What was the total mass of all the birds Arsham saw? 940 g.

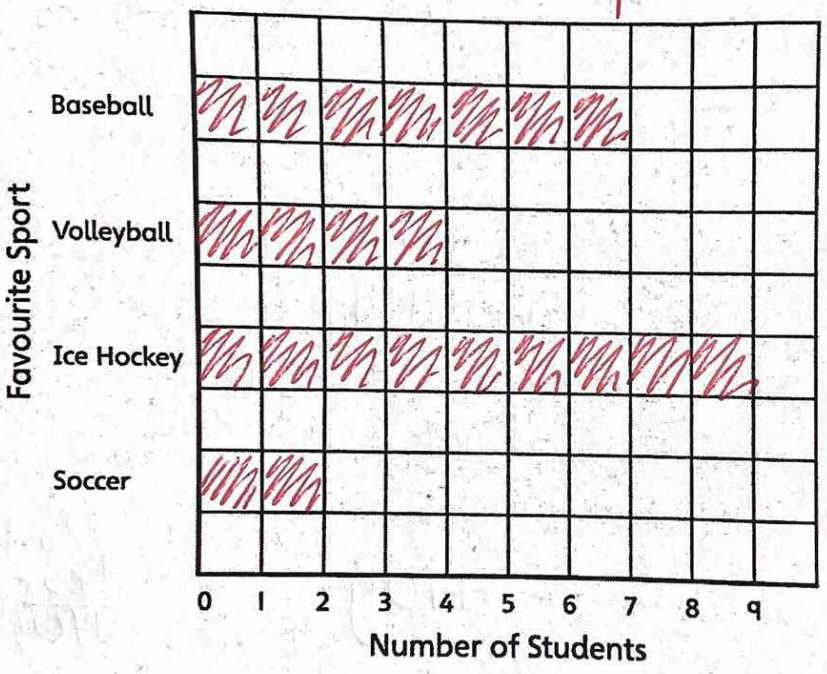
4. Amy asked her friends about their favourite sports and recorded the results in a tally chart.

Favourite Sport	Baseball	Volleyball	Ice Hockey	Soccer
Tally	𝍸 ||	||||	𝍸 ||||	||
Count	7	4	9	2

a) Complete the "count" on Amy's tally chart.

b) Use Amy's tally chart to complete the bar graph below.

Title: Favourite Sports



c) Which sport has the most data values? Ice hockey.

How can you find that from the graph? just look, it has the longest bar

d) Write two conclusions Amy can make from her data.

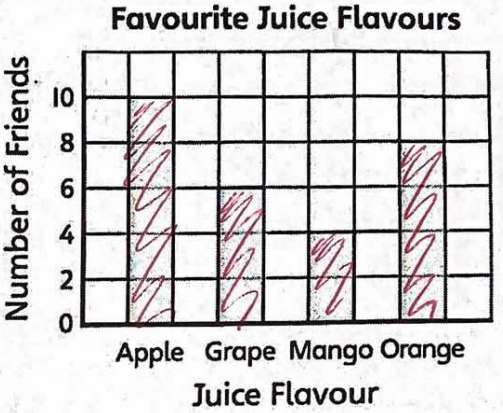
answers will vary

example: the least favourite sport was soccer

PDM3-8 Bar Graphs

Some bar graphs use skip counting in a scale.

1. Tessa asked her friends which juice they like best. She made a bar graph to show the results.



a) What was the most popular flavour?

apple

b) What was the least popular flavour?

mango

c) Roy wants to bring the 2 most popular flavours of juice to a party. Which flavours of juice should he bring?

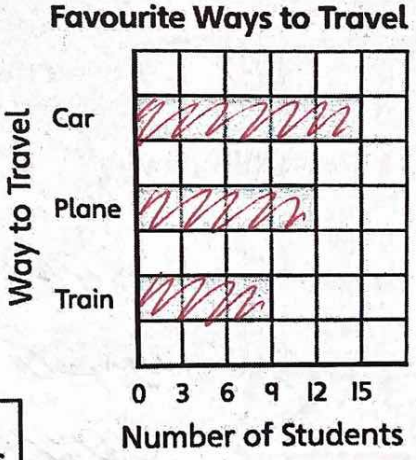
apple & orange

d) What number does the scale skip count by? 2

e) Skip count to fill in the table using the bar graph.

Juice Flavour	Apple	Grape	Mango	Orange
Number of Friends	10	6	4	8

2. Rick asked his classmates if they liked travelling by car, plane, or train the most. He shows the answers in a bar graph.



a) What number does the scale skip count by? 3

b) The bar for car travel is 5 blocks long.

Each block shows 3 students.

c) Use the bar graph to fill in the table.

Way to Travel	Number of Blocks	Multiplication	Number of Students
Car	5	$5 \times 3 = 15$	15
Plane	4	$4 \times 3 = 12$	12
Train	3	$3 \times 3 = 9$	9

3. A national park asked 100 people to vote for their favourite activity in the park. Some results are shown in the table.

Activity	Number of People
Boating	10
Cycling	25
Hiking	15
Swimming	50

a) How many people did not choose cycling?

75

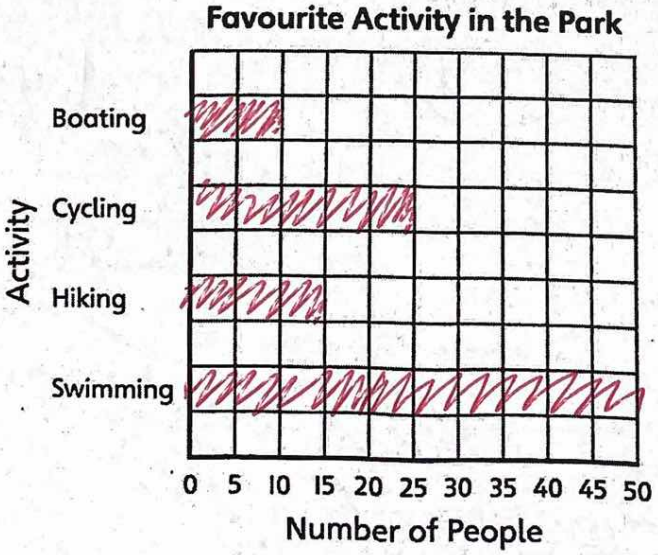
b) How many people chose cycling? 25
Write this number in the table.

c) What number does the scale in the bar graph in part e) below count by? 5

d) Fill in the table.

Activity	Number of People	Division	Length of Bar (Blocks)
Boating	10	$10 \div 5 = 2$	2
Cycling	25	$25 \div 5 = 5$	5
Hiking	15	$15 \div 5 = 3$	3
Swimming	50	$50 \div 5 = 10$	10

e) Finish the bar graph.

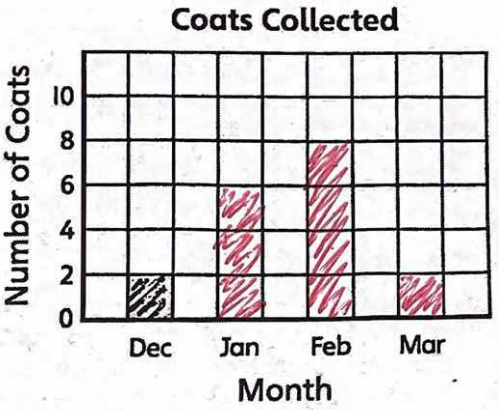


4. Grade 3 students collected coats for charity.

They collected 3 times as many coats in January as in December.

They collected 6 more coats in February than in December.

Altogether, they collected 18 coats.



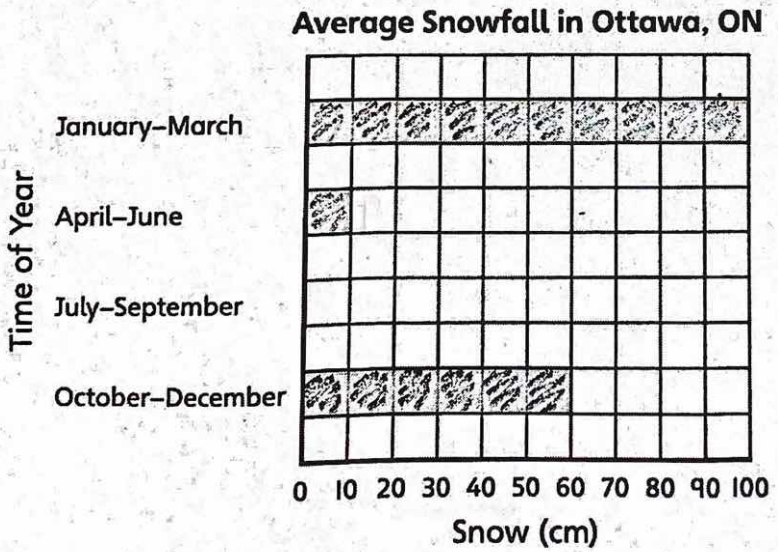
a) Use the clues above to fill in the missing bars.

b) In which month did students collect the most coats? February

c) In which two months did students collect the same number of coats? December and March

d) How many fewer coats did students collect in March than in February? 6 fewer

5. The bar graph shows how much snow fell in Ottawa, ON, during the year.



a) How many more centimetres of snow fell in the first three months of the year than in the last three months of the year? 40cm

b) How much snow fell in the whole year? 170 cm

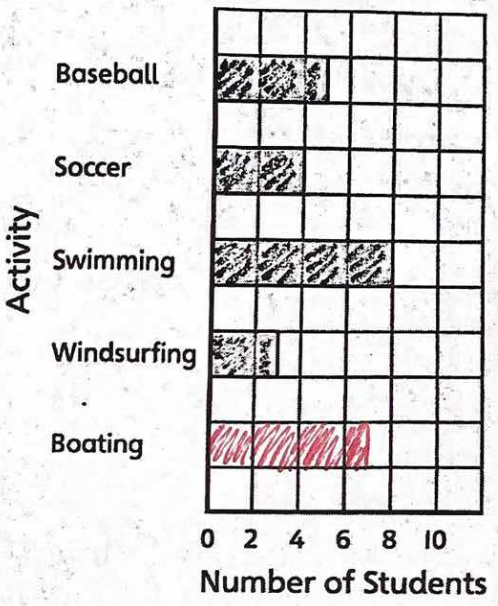
c) Which months have no bar? Explain why this makes sense. 3month. It's summer.

PDM3-9 Scales on Bar Graphs

A bar can end between two numbers on a bar graph.

1. Students voted for their favourite summer activity. The bar graph shows the results.

Favourite Summer Activity

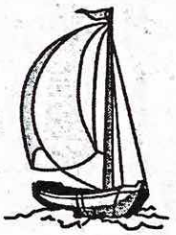


a) Fill in the table.

Favourite Activity	Number of Students
Baseball	5
Soccer	4
Swimming	8
Windsurfing	3

b) 7 students picked boating. Add the bar for them to the bar graph.

c) Fill in the blanks.



4 fewer students picked soccer than swimming.

3 more students picked swimming than baseball.

18 students picked water activities.

9 more students chose water (18) activities than ball (9) games.

Swimming was the most popular activity.

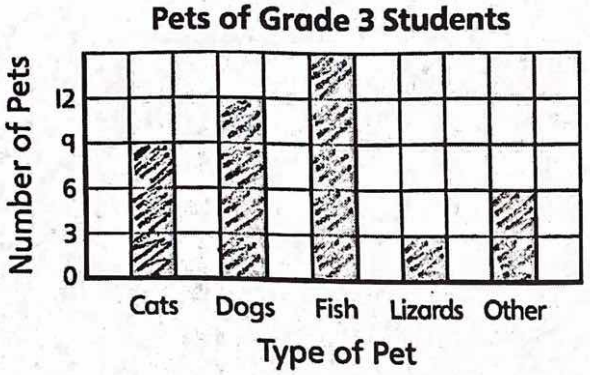
Windsurfing was the least popular activity.

BONUS ▶ Kevin thinks that the bar for swimming is 2 blocks longer than the bar for soccer, so 2 more students voted for swimming. Is he correct? Explain.

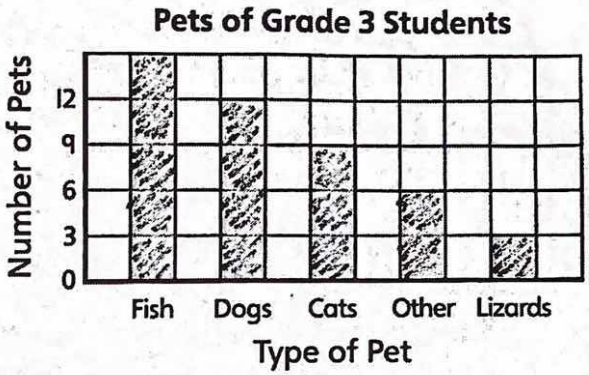
No. Each block = 2 students, so actually 4 more students voted for swimming than soccer.

2. Jake and Hanna asked their classmates about pets. The bar graphs show the results.

Jake's bar graph:

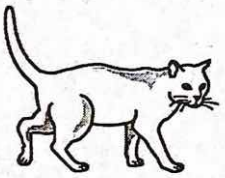


Hanna's bar graph:



a) Fill in the table.

Type of Pet	Number of Pets	
	Jake's Graph	Hanna's Graph
Cats	9	9
Dogs	12	12
Fish	~~14~~ 15	~~14~~ 15
Lizards	3	3
Other	6	6



b) Do the graphs show the same information? Yes

Do the graphs look the same? No.

c) How did Jake choose to order the labels on the horizontal axis?

Random.

How did Hanna choose to order the labels on the horizontal axis?

Starting with most favourite pet → least.

d) Which pet was the most common? Fish

On which graph is it easier to see that? Hanna's