



Year 4 Mathematics

Shapes & Data: Reading Graphs

Australian Curriculum v9.0 — AC9M4ST01

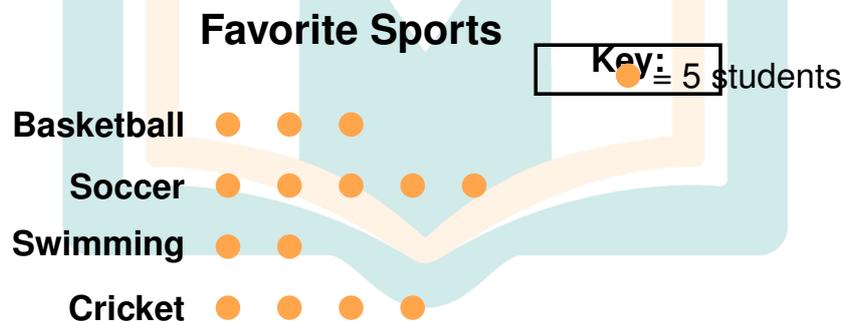
Worksheet 49: Many-to-One Pictographs

Name: _____ Date: _____

Section 1: Fluency – Reading the Key

In many-to-one pictographs, one symbol represents more than one item.
Always check the key!

1. Look at the pictograph showing "Favorite Sports":



How many students chose Basketball?

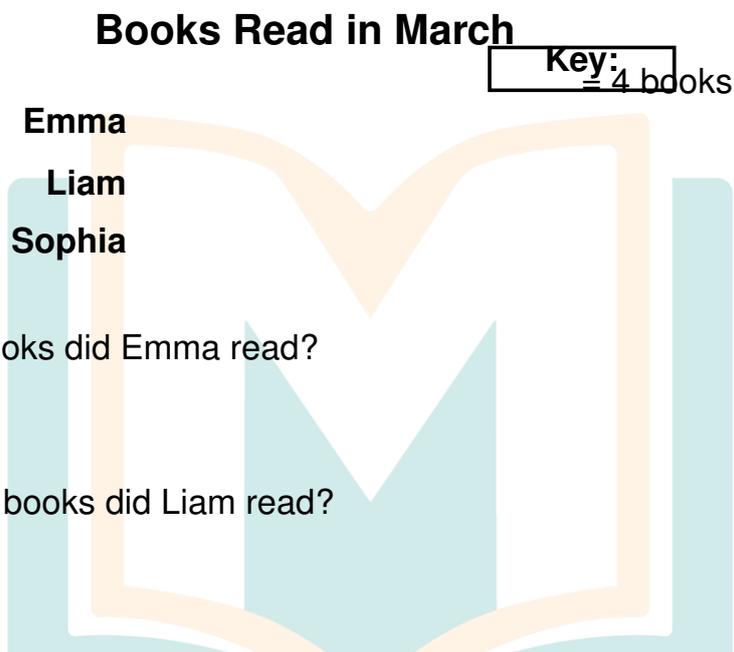
2. Using the same graph above, how many students chose Soccer?

3. How many students chose Swimming?

4. How many students chose Cricket?



- 5. Which sport was the most popular?
- 6. What is the total number of students who participated in the survey?
- 7. Look at this pictograph showing "Books Read in March":



How many books did Emma read?

8. How many books did Liam read?

Reward Box: Data Detective!



Excellent work reading pictographs!

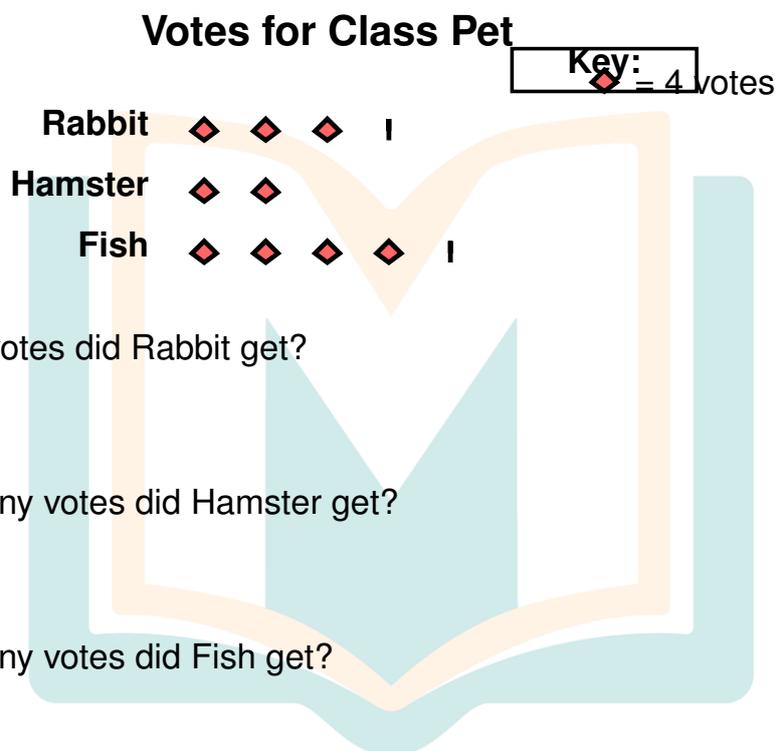
Year 4 Joke: Why did the pictograph go to the doctor?
Because it had too many symbols and needed a check-up!

Section 2: Reasoning – Representing Half-Symbols (AC9M4ST01)

Sometimes we need to show amounts that fall between whole symbols. We can use half-symbols!



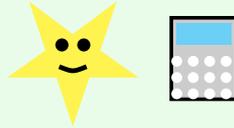
9. If 1 star = 10 points, what does half a star represent?
10. How would you draw 25 points if 1 star = 10 points? Explain your answer.
11. Look at this pictograph showing "Votes for Class Pet":



- How many votes did Rabbit get?
12. How many votes did Hamster get?
 13. How many votes did Fish get?
 14. Which pet received the most votes?
 15. If 1 icon = 6 people, how would you show 21 people using icons?
 16. If half an apple = 3 students, how many students does 1 whole apple represent?



Reward Box: Symbol Superstar!



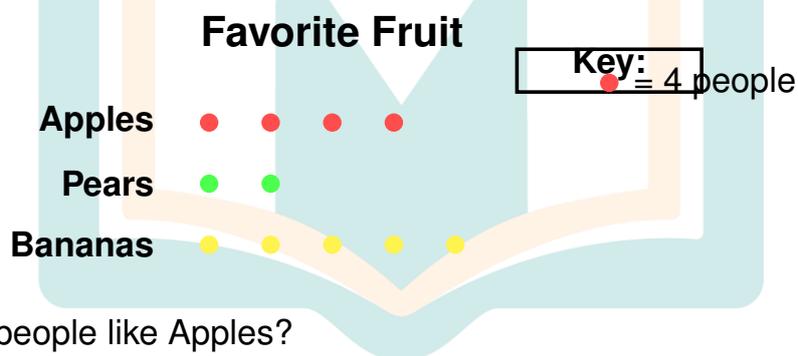
Amazing work with half-symbols!

Year 4 Joke: Why did the half-symbol feel incomplete?
Because it was only halfway to being awesome!

Section 3: Fluency – Comparing Data

We can use pictographs to compare amounts and find differences between categories.

17. Look at this "Favorite Fruit" pictograph:



How many people like Apples?

18. How many people like Pears?

19. How many more people like Apples than Pears?

20. How many people like Bananas?

21. Which fruit is the most popular?



22. What is the difference between the number of people who like Bananas and those who like Pears?

23. If we added Oranges with 3 icons, how many people would that represent?

24. How many people participated in this fruit survey in total?

Reward Box: Comparison Champion!



Superb work comparing data!

*Year 4 Joke: Why did the data go to the gym?
To work on its compare-ison!*

Fantastic! You're a Pictograph Pro!



Answer Key

Worksheet 49: Many-to-One Pictographs

Section 1: Fluency – Reading the Key

1.

$$3 \times 5 = 15 \text{ students}$$

2.

$$5 \times 5 = 25 \text{ students}$$

3.

$$2 \times 5 = 10 \text{ students}$$

4.

$$4 \times 5 = 20 \text{ students}$$

5. Soccer (with 25 students)

6.

$$15 + 25 + 10 + 20 = 70 \text{ students}$$

7.

$$3 \times 4 = 12 \text{ books}$$

8.

$$5 \times 4 = 20 \text{ books}$$



Section 2: Reasoning – Representing Half-Symbols

9. Half a star = 5 points

10. 2 and a half stars (2 full stars = 20 points, plus half a star = 5 points, total = 25 points)

11.

$$3 \times 4 + 2 = 12 + 2 = 14 \text{ votes}$$

12.

$$2 \times 4 = 8 \text{ votes}$$

13.

$$4 \times 4 + 2 = 16 + 2 = 18 \text{ votes}$$

14. Fish (with 18 votes)

15. 3 and a half icons (3 icons = 18 people, plus half an icon = 3 people, total = 21 people)

16.

$$3 \times 2 = 6 \text{ students}$$





Section 3: Fluency – Comparing Data

17.

$$4 \times 4 = 16 \text{ people}$$

18.

$$2 \times 4 = 8 \text{ people}$$

19.

$$16 - 8 = 8 \text{ more people}$$

20.

$$5 \times 4 = 20 \text{ people}$$

21. Bananas (with 20 people)

22.

$$20 - 8 = 12 \text{ people difference}$$

23.

$$3 \times 4 = 12 \text{ people}$$

24.

$$16 + 8 + 20 = 44 \text{ people}$$



Year 4 Mathematics

Shapes & Data: Reading Graphs

Australian Curriculum v9.0 — AC9M4ST01 & AC9M4ST02

Worksheet 50: Scaled Column Graphs

Name: _____ Date: _____

Section 1: Fluency – Reading Scaled Axes

Column graphs use scaled axes. Always check what each interval represents!

1. Look at this "Weekly Savings" column graph:



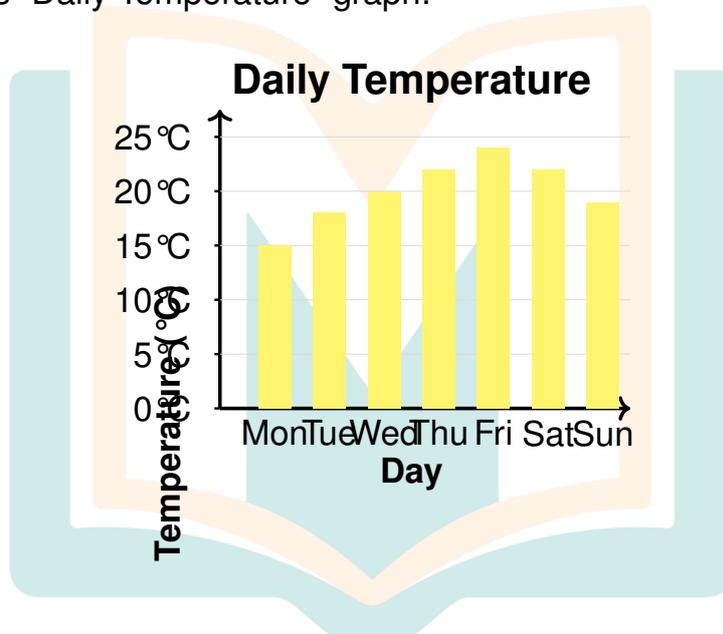
How much was saved in Week 1?

2. How much was saved in Week 2?

3. How much was saved in Week 3?



4. How much was saved in Week 4?
5. Which week had the highest savings?
6. What is the total amount saved over the 4 weeks?
7. Look at this "Daily Temperature" graph:

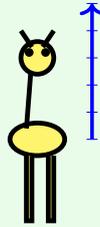


What was the temperature on Monday?

8. What was the temperature on Friday?



Reward Box: Graphing Greatness!



Wonderful work reading scales!

*Year 4 Joke: Why was the column graph so tall?
Because it had high values!*

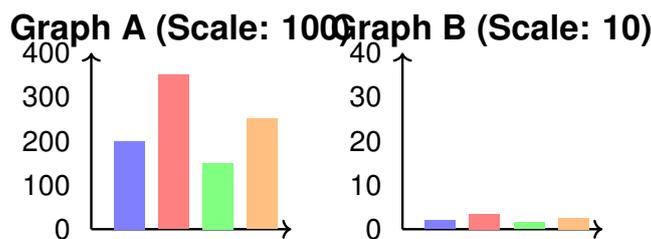
Section 2: Reasoning – Choosing the Best Display (AC9M4ST02)

Different scales are useful for different data. We need to choose scales that make data easy to read!

9. We are graphing the number of students in the whole school (600 kids). Why is a scale of 100 better than a scale of 1? Explain.

10. If you were graphing pocket money (amounts like \$2, \$5, \$8, \$10), which scale would be best: intervals of 1, 10, or 100? Explain.

11. Look at these two graphs showing the same data about "Books Sold":

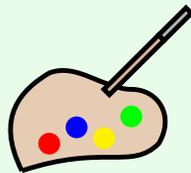


Which graph (A or B) is easier to read? Why?



12. True or False: A pictograph and a column graph can show the same data in different ways.
13. If you're comparing heights of students in your class (ranging from 130 cm to 150 cm), what would be a good scale to use?
14. Why might a column graph be better than a pictograph when showing data about money?
15. Look at the "Weekly Savings" graph from Section 1. If we changed the scale to intervals of 5, how would the graph look different?
16. When is it useful to use half-symbols in a pictograph instead of switching to a column graph?

Reward Box: Display Designer!



Excellent reasoning about data displays!

Year 4 Joke: Why did the graph go to art class?

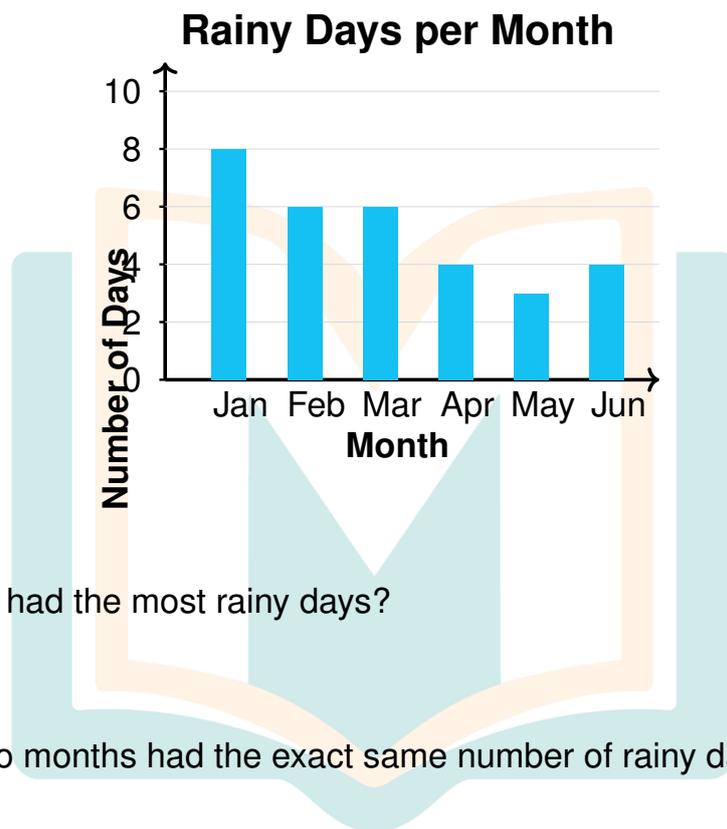
To learn about drawing the best scale!



Section 3: Challenge – Interpreting Variation

Data often varies. Let's analyze patterns, compare values, and find totals!

17. Look at this "Rainy Days per Month" graph:



Which month had the most rainy days?

18. Which two months had the exact same number of rainy days?

19. What was the total number of rainy days for those two months?

20. How many rainy days were there in January?

21. What is the difference between the rainiest month and the driest month?

22. What is the total number of rainy days from January to June?



23. If the pattern continues, would you expect more or fewer rainy days in July? Explain your reasoning.

24. Look at the "Daily Temperature" graph from Section 1. On which day was the temperature exactly 20°C ?

Reward Box: Analysis All-Star!



Outstanding data interpretation!

*Year 4 Joke: Why was the data so tired?
Because it had too many plots to analyze!*

Amazing! You're a Data Analysis Expert!



Answer Key

Worksheet 50: Scaled Column Graphs

Section 1: Fluency – Reading Scaled Axes

1. \$20 (the column reaches the 20 mark on the y-axis)
2. \$35 (the column reaches between 30 and 40, at 35)
3. \$30 (the column reaches the 30 mark)
4. \$40 (the column reaches the 40 mark)
5. Week 4 (with \$40)
- 6.

$$20 + 35 + 30 + 40 = \$125$$

7. 15°C (the column reaches the 15 mark, which is 3 intervals \times 5)
8. 24°C (the column reaches just below 25, at approximately 24)





Section 2: Reasoning – Choosing the Best Display

- 9.** A scale of 100 is better because with 600 students, a scale of 1 would require 600 intervals on the axis, making the graph extremely tall and difficult to read. A scale of 100 allows the data to fit neatly (0, 100, 200, 300, 400, 500, 600).
- 10.** Intervals of 1 would be best because the amounts are small (\$2 to \$10). Using intervals of 10 or 100 would make it hard to show differences between \$2 and \$5 accurately.
- 11.** Graph A is easier to read because the scale of 100 is appropriate for the data values (200, 350, 150, 250). Graph B uses a scale of 10, which makes all the columns appear very short and hard to distinguish from each other.
- 12.** True. Both can represent the same data, just in different visual formats.
- 13.** Intervals of 5 cm or 10 cm would work well (e.g., 120, 125, 130, 135, 140, 145, 150 or 120, 130, 140, 150). This allows the small differences between students' heights to be visible.
- 14.** Column graphs can show exact dollar amounts (including cents like \$12.50) more precisely, and it's easier to read exact values from a scaled axis than counting and calculating with many pictograph symbols.
- 15.** The graph would have more intervals on the y-axis (0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50) instead of (0, 10, 20, 30, 40, 50). The columns would reach different marks, making it easier to read in-between values like \$35.
- 16.** Half-symbols are useful when you have simple data with smaller numbers and you want a visual, engaging display that young students can easily understand and count. (Accept other reasonable explanations.)



Section 3: Challenge – Interpreting Variation

17. January (with 8 rainy days)

18. February and March (both had 6 rainy days)

19.

$$6 + 6 = 12 \text{ rainy days total}$$

20. 8 rainy days (the column reaches 4 intervals, and each interval = 2 days, so

$$4 \times 2 = 8$$

)

21.

$$8 - 3 = 5 \text{ days difference}$$

(January had 8 rainy days and May had 3 rainy days)

22.

$$8 + 6 + 6 + 4 + 3 + 4 = 31 \text{ rainy days}$$

23. Student's reasoning should note the trend: rainy days decreased from January (8) to May (3), then increased slightly in June (4). They might predict fewer rainy days continuing the general downward trend, or note the increase in June and predict variation. Accept reasonable explanations with supporting evidence from the graph.

24. Wednesday (the column reaches the 20°C mark, which is 4 intervals \times 5°C per interval = 20°C)



Teacher Notes

AC9M4ST01: Students represent data using many-to-one pictographs, column graphs and other displays; interpret and discuss the information.

AC9M4ST02: Students analyse the effectiveness of different displays in illustrating and comparing data distributions.

These worksheets provide comprehensive practice in:

- Reading and interpreting many-to-one pictographs (where one symbol = multiple items)
- Understanding and using half-symbols to represent partial values
- Comparing categories and calculating differences in pictographs
- Reading scaled column graphs with various intervals (1, 2, 5, 10, 100)
- Selecting appropriate scales for different types of data
- Analyzing the effectiveness of different graph types
- Identifying patterns, trends, and variation in data
- Calculating totals and differences from graphical displays

Key Teaching Points:

- Always read the key or scale before interpreting a graph
- Different scales are appropriate for different data ranges
- Both pictographs and column graphs can show the same data effectively
- Half-symbols allow more precision in pictographs
- Column graphs are better for showing exact values and larger numbers