

SIGMABUDGIE · GRADE 2

Graphs & Patterns

A gentle walkthrough & a 24-question exam

Part 1 walks through tally charts, pictographs, bar graphs, and patterns from the very beginning, with drawings. Part 2 is a 24-question exam that starts easy and slowly builds to harder, ISEE-style reasoning questions. Work through the lesson together first, then let your child try the exam. The answer key at the back explains every question.

1 · Tally marks

A **tally mark** is one line for one thing. We asked 10 kids about their favorite pet and made a mark for each answer.

Every fifth mark goes across the other four, so you can count by 5s. Cat has 3 marks, Dog has 5, Fish has 2.

Favorite pet		
Cat		3
Dog	/	5
Fish		2

a tally chart

2 · Pictographs: one picture each

A **pictograph** uses pictures. The **key** at the bottom says what one picture means. Here ★ = 1 kid.

Dog has 5 stars, so 5 kids chose Dog. Just count the stars.



each ★ is 1 kid

3 • When one picture means two

Sometimes the key says ★ = 2. Then you count by 2s. Mia has 3 stars: 2, 4, **6** books.

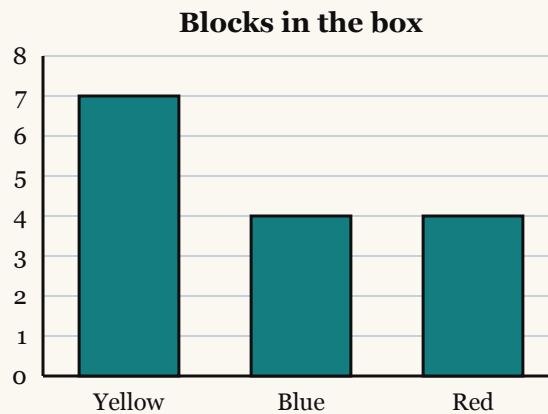
Always read the key first!



4 • Bar graphs

A **bar graph** uses bars. Taller bar means more. Read a bar by looking at the top of it and sliding left to the number.

Yellow: 7. Blue: 4. Red: 4.

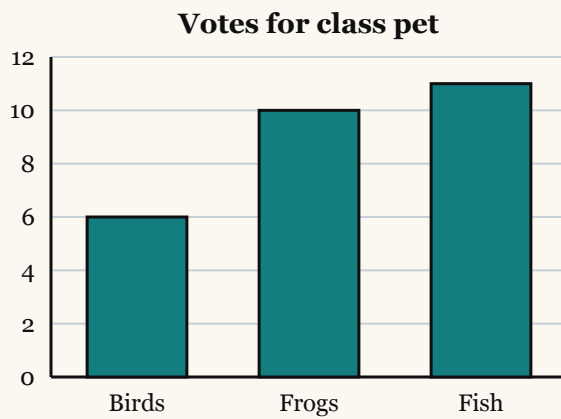


Yellow 7, Blue 4, Red 4

5 • Most and fewest

The **most** is the tallest bar. The **fewest** is the shortest.

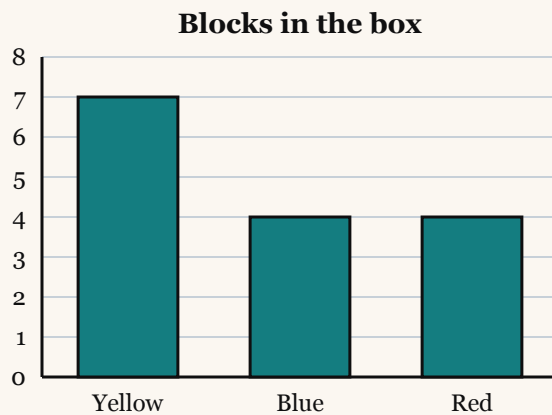
Fish got the most votes (11). Birds got the fewest (6). When the side counts by 2s, a bar can stop between two numbers: Fish stops halfway between 10 and 12, that is 11.



Birds 6, Frogs 10, Fish 11

6 • How many in all?

Add every bar. Yellow 7 + Blue 4 + Red 4 = **15** blocks in all.

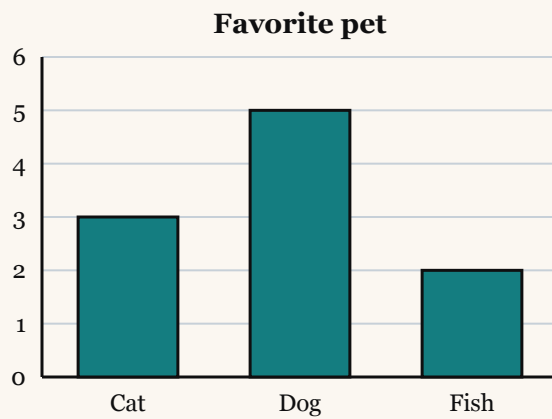


$$7 + 4 + 4 = 15$$

7 • How many more?

"How many more" means **subtract** the smaller from the bigger. Dog 5 and Cat 3: $5 - 3 = 2$ more kids chose Dog.

Or count the steps from the top of the short bar up to the top of the tall one.



Dog has 2 more than Cat

8 • Number patterns that add

A **pattern** follows a rule. 2, 12, 22, 32... each number is **10 more**. Next: **42**.

To find the rule, ask "what do I add to get from one number to the next?"

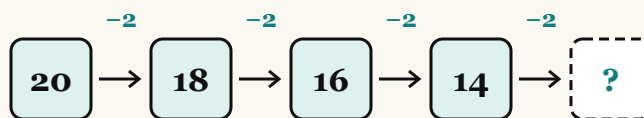


rule: add 10. Next: 42

9 • Patterns that count back

20, 18, 16, 14... each number is **2 less**. Next: **12**.

If the numbers get smaller, the rule takes away.



rule: take away 2. Next: 12

10 • Shape patterns

Shapes can make a pattern too. Circle, square, circle, square... The part that repeats is the **core**: circle, square.

After a square comes a **circle**. Say the pattern out loud to hear the rhythm.



next: circle



core: circle, square, triangle. Next: circle

11 • Missing numbers in the middle

5, 10, __, 20, 25. The rule is add 5, so the missing number is **15**.

Look at the numbers on both sides of the blank. The blank must fit between them.



the blank is 15

12 • Reading a chart in words

Sometimes a test gives the numbers in words instead of a picture: "A chart shows blocks: yellow 7, blue 4, red 4."

Treat it like a graph. Most? Yellow. In all? 15. How many more yellow than blue? 3. You are ready for the test! 🎉

Read each drawing first, then choose the best answer. Take your time, there is no clock here. Questions start gentle and get harder toward the end. Circle your answer.

1 How many kids chose Dog?

Favorite pet		
Cat		3
Dog	/	5
Fish		2

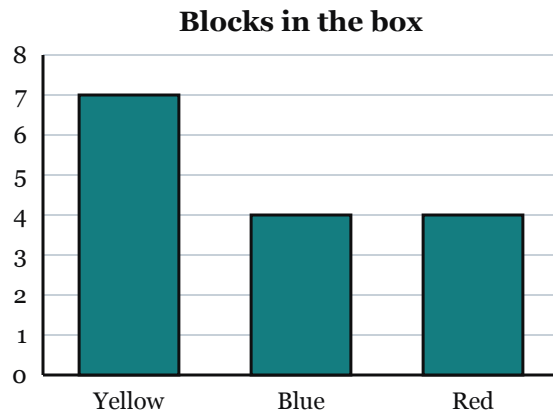
- A** 3
- B** 5
- C** 2
- D** 10

2 How many kids chose Cat?



- A** 5
- B** 2
- C** 1
- D** 3

3 How many yellow blocks are there?



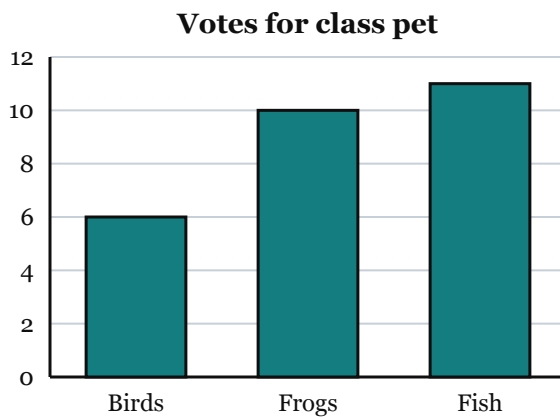
A 7

C 8

B 4

D 15

4 Which animal got the most votes?



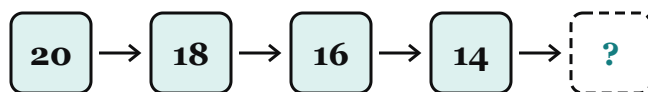
A Frogs

C Fish

B Birds

D They are equal

5 What number comes next?



A 13

C 10

B 15

D 12

6 Which shape comes next?



A square

B circle

C triangle

D star

7 How many books did Mia read?



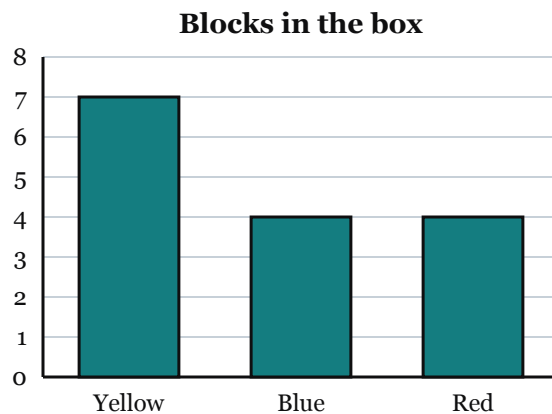
A 3

B 4

C 6

D 8

8 How many blocks are there in all?



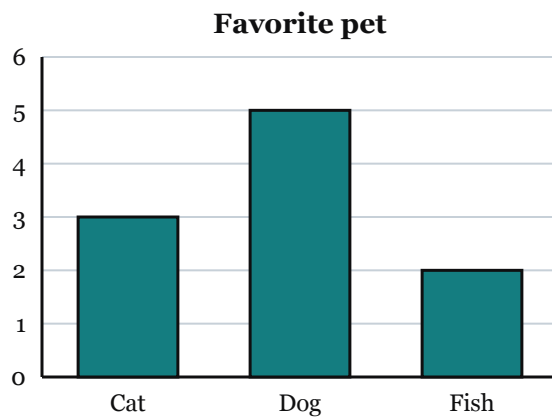
A 15

B 11

C 7

D 14

9 How many more kids chose Dog than Cat?



A 8

B 2

C 3

D 5

10 What number comes next?



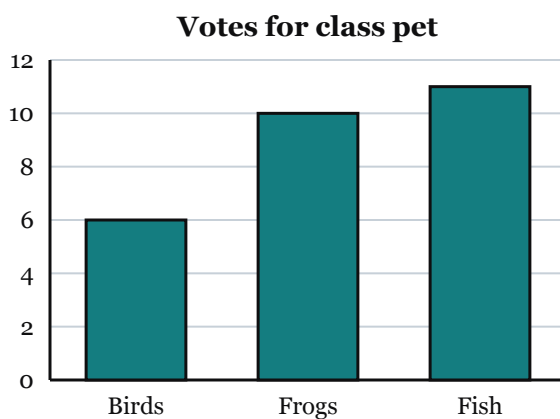
A 33

B 40

C 52

D 42

11 How many votes did Fish get?



A 11

B 10

C 12

D 6

12 What is the missing number?



A 12

B 14

C 15

D 30

13 A chart shows blocks: yellow 8, green 7, blue 3. How many blocks in all?

A 15

B 11

C 10

D 18

14 Which shape comes next?



A circle

B square

C triangle

D star

15 How many more books did Ava read than Leo?



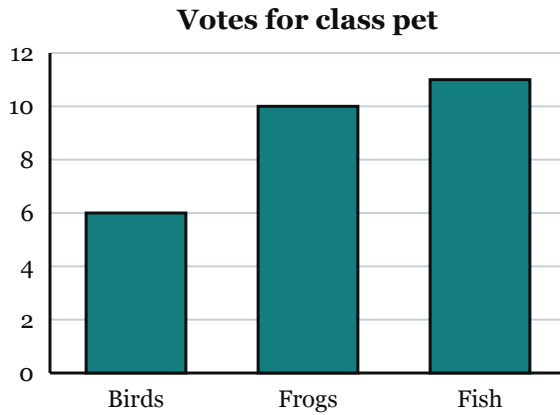
A 4

B 2

C 8

D 12

16 How many more votes did Fish get than Birds?



- A** 4
- B** 6
- C** 5
- D** 17

17 What number comes next? 27, 25, 23, 21, ____

- A** 20
- B** 18
- C** 19
- D** 23

18 A chart shows votes: Birds 6, Frogs 10, Fish 11. How many kids voted in all?

- A** 27

B 26

C 21

D 17

19 What is the rule for 3, 8, 13, 18?

- A** add 3 **B** add 10
C take away 5 **D** add 5

- 20** How many books did Mia, Leo, and Ava read all together?



- A** 9
- B** 18
- C** 16
- D** 20

- 21** What number comes next? 45, 40, 35, 30, ____

- A** 25
- B** 20
- C** 35
- D** 26

- 22** A chart shows blocks: blue 3, yellow 4, red 6. Which is true?

- A** Blue has the most.
- B** Yellow and red are equal.
- C** Red has 3 more than blue.
- D** There are 12 blocks in all.

- 23** The pattern circle, square, square repeats. What is the 7th shape?



- A** square
- B** circle
- C** triangle
- D** You cannot tell

- 24** What is the missing number? 100, 90, ____, 70, 60

- A** 85
- B** 95
- C** 75
- D** 80

ANSWER KEY & EXPLANATIONS

- 1 B** Dog has 5 tally marks: four lines and one across.
-
- 2 D** Each ★ is 1 kid. Cat has 3 stars.
-
- 3 A** The Yellow bar stops at 7.
-
- 4 C** The tallest bar is Fish.
-
- 5 D** The rule is take away 2: $14 - 2 = 12$.
-
- 6 B** The core is circle, square. After a square comes a circle.
-
- 7 C** Each ★ is 2 books. Mia has 3 stars: 2, 4, 6.
-
- 8 A** $7 + 4 + 4 = 15$.
-
- 9 B** Dog 5, Cat 3. $5 - 3 = 2$.
-
- 10 D** Each number is 10 more: $32 + 10 = 42$.
-
- 11 A** The side counts by 2s. The Fish bar stops halfway between 10 and 12: 11.
-
- 12 C** The rule is add 5: $10 + 5 = 15$.
-
- 13 D** $8 + 7 + 3 = 18$.
-
- 14 B** The core is circle, square, triangle. After a circle comes a square.
-
- 15 A** Ava 4 stars = 8 books. Leo 2 stars = 4 books. $8 - 4 = 4$.
-
- 16 C** Fish 11, Birds 6. $11 - 6 = 5$.
-
- 17 C** Take away 2 each time: $21 - 2 = 19$.
-
- 18 A** $6 + 10 + 11 = 27$.
-
- 19 D** $3 \rightarrow 8 \rightarrow 13 \rightarrow 18$: each number is 5 more.
-
- 20 B** Mia 6, Leo 4, Ava 8. $6 + 4 + 8 = 18$.
-
- 21 A** Take away 5 each time: $30 - 5 = 25$.
-
- 22 C** Red 6 – Blue 3 = 3. There are 13 in all, and red has the most.
-
- 23 B** The core has 3 shapes. Shapes 1, 4, and 7 are all circles.
-
- 24 D** Take away 10 each time: $90 - 10 = 80$.
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