

WA5MPSP1

Probability

Core + Challenge

NAPLAN-style

# Equally Likely or Not?

I can decide if the outcomes of a chance event are equally likely or not, and say if a game is fair.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 56

## Key idea

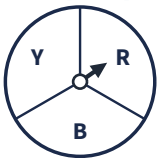
Outcomes are **equally likely** when each one has the **same chance** of happening.

Equal parts on a spinner, a fair coin, a normal die, or the **same number** of each colour in a bag give equally likely outcomes.

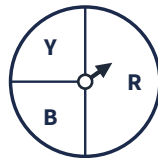
If some parts are **bigger**, or there are **more** of one colour, the outcomes are **not equally likely**. A game is **fair** when every player has the same chance to win.

Example: spinner A has 3 equal parts, so red, blue and yellow are equally likely. Spinner B has the same colours, but red covers **half** of it, so red is more likely.

### A Equally likely



### B Not equally likely



A

## Warm up *sort, shade and label*

/ 16 marks

Are all the colours (or numbers) **equally likely**? For a bag, you take one counter without looking. Write **yes** or **no**. 1 mark each.

1



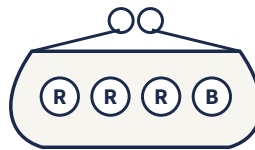
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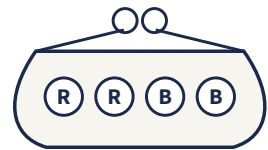
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3



\_\_\_\_\_

4



\_\_\_\_\_

5



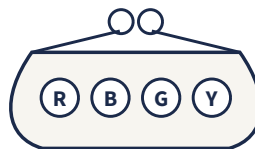
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6



\_\_\_\_\_

7



\_\_\_\_\_

8



\_\_\_\_\_

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Write **E** if the two outcomes are equally likely. Write **N** if they are **not** equally likely. 1 mark each.

- 9 Tossing a coin: **heads** or **tails**

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- 10 Rolling a normal die: a **6** or **not** a 6

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- 11 Rolling a normal die: an **odd** or an **even** number

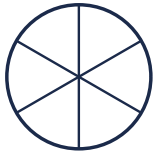
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- 12 Choosing a letter from **PERTH** without looking: a **vowel** or **not** a vowel

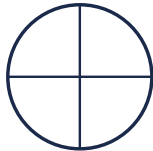
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Shade, label or draw. 1 mark each.

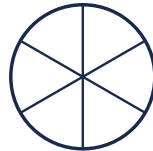
- 13 Shade so **shaded** and **white** are equally likely.



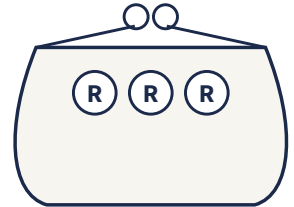
- 14 Shade so shaded and white are **not** equally likely.



- 15 Write **R**, **B** or **G** so the 3 colours are equally likely.



- 16 Draw counters so **red** and **blue** are equally likely.

**B****Practise** *use the skill*

/ 21 marks

- 1 Class 5K has 14 girls and 12 boys. Mr Kelly puts every name in a hat and picks one without looking. **a)** Are a girl and a boy equally likely to be picked? Explain. **b)** Describe one way to change the names in the hat so that a girl and a boy **are** equally likely. [2 marks]

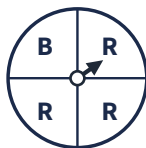
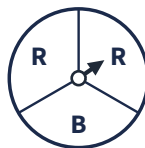
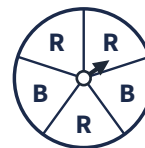
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Answer: \_\_\_\_\_

- 2 Tom wins if the spinner lands on **red** (R). Ava wins if it lands on **blue** (B). Which spinner makes the game **fair**? Circle it. Then explain why spinner A is **not** fair. [2 marks]

**A****B****C****D**


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Answer: \_\_\_\_\_

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- 3 Sort the events. Write each letter in the correct column of the table. [3 marks]

**A** Spinning a spinner with 5 equal parts numbered 1 to 5: **odd** or **even**

**D** A day in January in Perth: **rain** or **no rain**

**B** Choosing a day of the week at random: a **weekday** or a **weekend** day

**E** Taking a counter from a bag of 5 green and 5 yellow: **green** or **yellow**

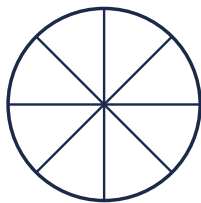
**C** Picking one card from cards numbered 1 to 10: **1 to 5** or **6 to 10**

**F** Rolling a normal die: a number **less than 4** or **more than 3**

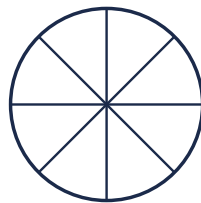
| Equally likely | Not equally likely |
|----------------|--------------------|
|                |                    |

- 4 Write **R** or **B** in every part of each spinner. **a)** Red and blue are equally likely. **b)** Red is **more likely** than blue, but blue can still happen. [2 marks]

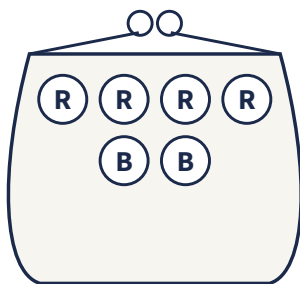
**a)**



**b)**



- 5 The bag has 4 red and 2 blue counters. **a)** Are red and blue equally likely? Explain. **b)** Draw the **fewest** counters you could **add** to make red and blue equally likely. [2 marks]




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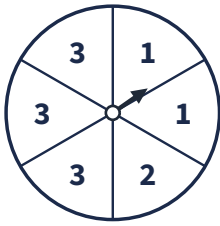
Answer: \_\_\_\_\_

- 6 Is each game **fair** or **not fair**? Complete the table. [3 marks]

| Game                                                                                   | Fair or not fair? | Reason |
|----------------------------------------------------------------------------------------|-------------------|--------|
| Toss a coin. Tom wins on heads. Ava wins on tails.                                     |                   |        |
| Roll a die. Tom wins on 1 or 2. Ava wins on 3, 4, 5 or 6.                              |                   |        |
| Pick a card from cards 1 to 10. Tom wins on an even number. Ava wins on an odd number. |                   |        |

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- 7 This spinner has 6 equal parts. **a)** Which number is **most** likely? **b)** Are 1 and 2 equally likely? Explain. **c)** Change **one** number so that 1, 2 and 3 are **all** equally likely. Cross it out and write the new number. [3 marks]




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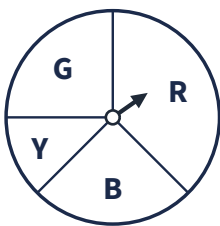
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Answer: \_\_\_\_\_

- 8 This spinner's parts are **not** all the same size. **a)** Which colour is **most** likely? **b)** Which two colours are equally likely? **c)** Which colour is **least** likely? [2 marks]




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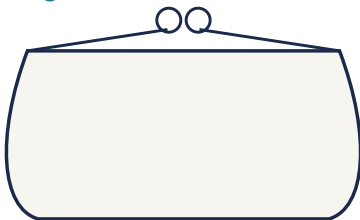


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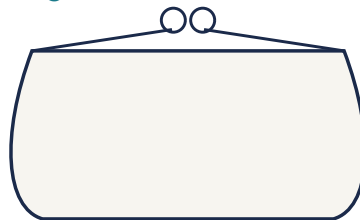
Answer: \_\_\_\_\_

- 9 Draw counters in each empty bag. **Bag A:** 6 counters, only red (R) and blue (B). Red and blue are equally likely. **Bag B:** 9 counters: red, blue and green (G). All three colours are equally likely. [2 marks]

Bag A



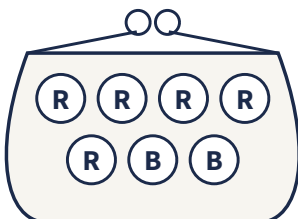
Bag B



**C** Think it through *explain your thinking*

/ 10 marks

- 1 Zoe says, "There are only **two** colours in this bag, so red and blue are equally likely." Do you agree with Zoe? Explain. [2 marks]




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- 2 **True or false?** “If a spinner has 4 parts, landing on each part is equally likely.” [2 marks]  
Explain. You may draw a spinner to help.

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- 3 **Always, sometimes or never true?** “If a bag holds only red and blue counters, taking a red and taking a blue are equally likely.” Give examples. [2 marks]

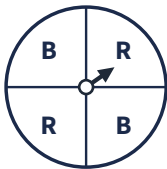
Circle one: **Always** / **Sometimes** / **Never**

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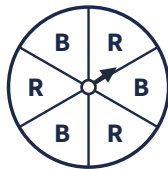
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- 4 Which spinner is the **odd one out**? Explain. [2 marks]

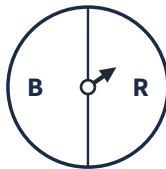
A



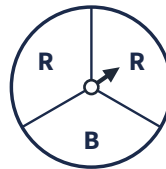
B



C



D




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- 5 Kai and Lily play a game with a normal die. Kai wins if the number is **bigger than 4**. Lily wins if it is **less than 4**. Kai says, “The game is fair, because we both use the number 4.” Do you agree with Kai? Explain. [2 marks]

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**D**

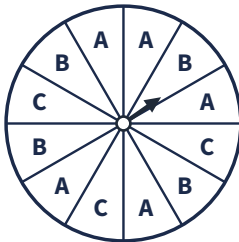
**Challenge** *stretch yourself*

/ 9 marks

- 1 A bag holds **12** counters: red, blue or green, with **at least one** of each colour. Red and blue are equally likely, but the three colours are **not all** equally likely. Find **all** the possible bags. [3 marks]

| Red | Blue | Green |
|-----|------|-------|
|     |      |       |
|     |      |       |
|     |      |       |
|     |      |       |
|     |      |       |

- 2 Mia's spinner is for a game for players **A**, **B** and **C**: the letter that comes up wins. [3 marks]  
**a)** How many parts should each player have for a fair game? **b)** Is Mia's game fair? Who is most likely to win? **c)** Change the **fewest** parts possible to make it fair. Which letter do you change?



Answer: \_\_\_\_\_

- 3 Priya and Jack share the numbers on a normal die (1 to 6). Each number belongs to one player. They roll the die once. **a)** How many numbers must each player have for the game to be fair? **b)** Find **all** the fair ways in which Priya's numbers add up to **10**. **c)** Explain why the two players' numbers can **never** add up to the same total. [3 marks]

Answer: \_\_\_\_\_

**How did I go?**

Warm up \_\_\_\_ / 16 Practise \_\_\_\_ / 21 Think it through \_\_\_\_ / 10 Challenge \_\_\_\_ / 9 **Total** \_\_\_\_ / 56

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