

Probability experiments

WORKIT!

50 light bulbs were tested; 44 lasted for 1500 hours or more, and 6 for less than 1500 hours.

In a batch of 1000 light bulbs, how many would be expected to last for less than 1500 hours?

Relative frequency for less than 1500 hours
 $= \frac{6}{50}$, so frequency $= \frac{6}{50} \times 1000$
 $= 120$ light bulbs

NAILIT!

When probability experiments are conducted (e.g. throwing a dice, spinning a spinner, etc.)

$$\text{Relative frequency} = \frac{\text{frequency of particular event}}{\text{total trials in experiment}}$$

The value for the relative frequency will only approach the theoretical probability over a very large number of trials.

- ① A pentagonal unbiased spinner with sides numbered 1 to 5 was spun 100 times. (★★★)
 The frequency that the spinner landed on each number was recorded in the table below.

Score on spinner	1	2	3	4	5
Frequency	18	23	22	19	18

- a Abdul says that the spinner must be biased because if it was fair the frequency for each score would be the same. Explain why Abdul is wrong. (1 mark)
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- b Calculate the relative frequency of obtaining a score of 3 on the spinner. Give your answer as a fraction in its simplest form. (2 marks)
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- c If the spinner was spun 500 times, use the relative frequency to estimate how many times the spinner would give a score of 4. (1 mark)
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[Total: 4 marks]