GCSE HIGHER · REVISION MAT 1

Sample size and reliability

1 Red came up 3 times in 10 spins.

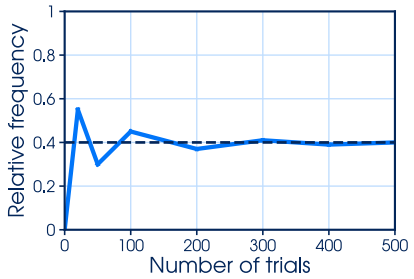
Find the relative frequency of red.

2 Which value gives the best estimate of P(red)?

Trials	10	50	100	500
Relative frequency	0.3	0.24	0.27	0.25

3 Explain why a larger sample gives a better estimate of a probability.

4 The graph shows the relative frequency of a spinner landing on blue.



Estimate P(blue) and the number of blues in 1000 spins.

5 A coin lands heads twice in 4 flips.

Explain why this does not prove the coin is fair.

6 Ana gets 7 sixes in 20 rolls.

Ben gets 52 sixes in 300 rolls.

Whose estimate of P(6) is more reliable? Explain.

7 Explain why a relative frequency changes a lot at first, then settles down.

8 Ana gets 7 sixes in 20 rolls and Ben gets 52 sixes in 300 rolls of the same dice.

Combine their results to give the best estimate of P(6).

Mr&Mrs MATHS

ANSWERS · REVISION MAT 1

Sample size and reliability

1 0.3

2 0.25: it comes from the most trials.

3 Random variation has less effect over many trials.

4 Settles at about 0.4

0.4; about 400

5 4 flips is far too few to be sure.

6 Ben's: he did many more trials.

7 Each new trial has a big effect when there are few trials, and a small one when there are many.

8 $\frac{7 + 52}{20 + 300} = \frac{59}{320}$

≈ 0.184

Mr&Mrs MATHS