Year 7 Probability topic test

Name: _____ Date: _____

15 questions | 39 marks | 45 minutes

A progressive by-hand paper on single-stage chance, expected frequencies, experimental records and simulation interpretation. All required data are supplied.

No calculator needed.

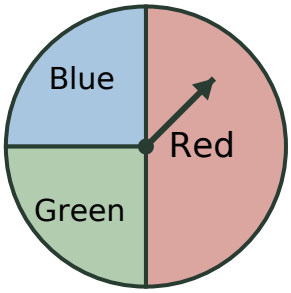
1. List the ordinary two-outcome sample space for one coin toss. [1 mark]

2. An ordinary six-sided die is rolled. Classify “a result greater than 6” as impossible, possible or certain. [1 mark]

3. A fair die is rolled. Find the probability of an even result. [2 marks]

4. One card is chosen at random from cards numbered 1 to 15. Find the chance of a multiple of 5. [2 marks]

5. Use the ideal spinner shown. Find the probability of blue and explain why it is not $\frac{1}{3}$. [2 marks]



Red: one half

Blue: one quarter

Green: one quarter

Each direction is equally likely.

6. A bag holds 5 red, 2 blue and 5 green equal-size counters. A counter is chosen at random. Find the chance that it is not red. [3 marks]

7. An event has chance $\frac{1}{5}$. Find its expected frequency in 60 trials. [2 marks]

8. An event has chance $\frac{2}{5}$. Its expected frequency in 8 trials is 3.2. Explain why this is valid even though an actual count cannot include part of a result. [2 marks]

9. Heads occurred 21 times in 35 tosses. Find its relative frequency as a simplified fraction. [2 marks]

10. Use the supplied results. Find the total trials and the relative frequency of yellow. [3 marks]

Example spinner results

Colour	Frequency
Red	13
Blue	11
Yellow	16

11. A coin gave 25 heads in 36 tosses. A student says this proves it is unfair. Explain the problem with that conclusion. [3 marks]

12. Comparable experiments record 9 successes in 15 trials and 18 in 35 trials. Find their combined relative frequency. [3 marks]

13. Plan 50 random draws from a bag with 4 red and 6 blue equal-size counters. State how you keep the chances unchanged and how you record the results. [3 marks]

14. Use the supplied die-simulation records. Answer each part. [5 marks]

Supplied example die-simulation records; each row is a separate run

Trials	1	2	3	4	5	6
60	7	12	9	13	8	11
600	101	98	95	107	103	96

(a) Find the prime-result relative frequency in the 60-trial run. [2 marks]

(b) For 600 fair-die trials, find the expected prime count and compare it with the observed count. [3 marks]

15. A fair coin will be tossed 80 times. After 40 tosses, 15 heads were recorded. Answer each part. [5 marks]

(a) How many heads were expected in the first 40 tosses, and how far below that is the observed count? [2 marks]

(b) How many heads are expected in the next 40 tosses? Explain why the coin does not need to catch up. [3 marks]