Theoretical probability

List the outcomes first. Use favourable over total only when the outcomes are equally likely.

A fair six-sided die is rolled. Find the probability of rolling more than 4.

$\{1,2,3,4,5,6\}$	These are the six equally likely outcomes.
$\{5,6\}$	Only 5 and 6 are greater than 4.
$P(X>4)=\frac{2}{6}$	Put the favourable count above the total count.

$P(X>4)=\frac{1}{3}$

Probability scale

0 means impossible, 1 means certain, and all probabilities lie between 0 and 1.

Complementary outcomes

The complement of an event is everything that is not in that event.

A bag has 4 red, 3 blue and 5 green counters. Find the probability of not choosing red.

$P(\text{red}) = \frac{4}{12} = \frac{1}{3}$	There are 12 counters in all.
$P(\text{not red}) = 1 - P(\text{red})$	Red and not red together cover all outcomes.
$1 - \frac{1}{3} = \frac{3}{3} - \frac{1}{3}$	Use a common denominator.
$P(\text{not red}) = \frac{2}{3}$	

Experimental probability

Relative frequency is the fraction of trials in which the event occurred.

A spinner lands on blue 27 times in 60 spins. Estimate the probability of blue.

$P(\text{blue}) \approx \frac{27}{60}$	Use observed successes over trials.
$\frac{27}{60} = \frac{9}{20} = 0.45$	Simplify or convert to a decimal.

$P(\text{blue}) \approx 45\%$

Using that estimate, predict the number of blue results in 200 spins.

$200(0.45) = 90$	Multiply the number of trials by the estimated probability.

90 blue results (estimate)

Probability

Try the questions before opening the separate answer key. Show one step per line.

26.1 · Fluency

A fair die is rolled. Find the probability of a multiple of 3.

26.2 · Variation

A spinner lands on green 27 times out of 90. Estimate the chance of green.

26.3 · Choose a method

The probability of bus being late is 0.18. Find the chance it is not late and predict the number of not-late days in 50 days.

Check your work: are the sign, units and level of accuracy appropriate?