# Probability: flowchart

Planner week 3 · One event or two? Follow the arrows to find out

**A probability question**

**How many things happen?**
one spin, or two coins, two days …

**One**

**One event: what are you asked?**

**The probability of it**
ways ÷ total · 5 blue, 9 red, 8 pink: P(red) = $\frac{9}{22}$

**It NOT happening**
1 − P(it happens) · P(not pink) = 1 − $\frac{8}{22}$ = $\frac{14}{22}$

**A missing one in a table**
the probabilities add up to 1: 1 − (0.2 + 0.4 + 0.1) = **0.3**

**How many times to expect**
probability × number of tries: 0.2 × 60 = **12 times**

**Two or more**

**Two events: what are you asked?**

**Every possible outcome**
list in order: coin thrown 3 times
HHH HHT HTH HTT THH THT TTH TTT
2 × 2 × 2 = **8 outcomes**

**Both happen ("and")**
multiply along the branches of the tree:
P(both heads) = 0.6 × 0.55 = **0.33**
More than one route? Add the routes.

**Check every answer**
between 0 and 1 · a fraction or decimal, not 9 : 22

**0** impossible — unlikely — **0.5** evens — likely — **1** certain

## The big question

Is it **one** event, or **two** things happening?

Then: what exactly am I asked to find?

## Key words

**Fair**: every outcome is equally likely
**Biased**: not fair
**At random**: each one has the same chance
**Relative frequency**: successes ÷ tries

## Watch out

- Writing 9 out of 22 or 9 : 22.
- Adding along tree branches instead of multiplying.
- HT and TH are different outcomes.