

Probability of Two Events

7th Grade

Multiply for 'and', add for 'or' — once you have checked for overlap.

For independent events, multiply the probabilities for 'and'. For mutually exclusive events, add them for 'or'.

$$P(A \text{ and } B) = P(A) \times P(B)$$

Two heads in a row

$$1/2 \times 1/2 = 1/4$$

Independent — one flip does not affect the other.

A 6 then a 6

$$1/6 \times 1/6 = 1/36$$

Two dice, independent.

A 2 or a 5 on one die

$$1/6 + 1/6 = 1/3$$

Cannot both happen, so add.

Two aces, no replacement

$$4/52 \times 3/51$$

Not independent — the deck changed.

THE COMMON MISTAKE

✗ **always multiplying**

✓ **check whether the first event changed the second**

Without replacement, the second probability is different.

'And' narrows things down, so the answer gets smaller. 'Or' widens it, so it gets bigger.