

## Listing Outcomes with Two Events

### Starter

1. **(Review of last lesson)** In a box of chalk, 10 pieces are white, 5 are yellow and 3 are red. Emma chooses one piece at random. Find the probability that this piece is:

(a) yellow                      (b) not red                      (c) white or red

**Working:** (a) There are  $10 + 5 + 3 = 18$  pieces of chalk in total.

$$\text{So } P(\text{Yellow}) = \frac{5}{18}$$

(b)  $P(\text{not Red}) = 1 - P(\text{Red})$

$$= 1 - \frac{3}{18}$$

$$= \frac{15}{18} = \frac{5}{6}$$

(c)  $P(\text{White or Red}) = P(\text{White}) + P(\text{Red})$

$$= \frac{10}{18} + \frac{3}{18}$$

$$= \frac{13}{18}$$

2. List the possible outcomes when two fair coins are tossed. Write down the probability of getting each outcome.

**Working:** HH                      HT                      TH                      TT  
There are 4 possible outcomes

Since each outcome is equally likely, the probability of each outcome is  $\frac{1}{4}$ .

- E.g. 1** List the possible outcomes when an unbiased coin is tossed and a 6-sided fair dice is rolled. Write down the probability of each outcome.

**Working:**

		Dice					
		1	2	3	4	5	6
Coin	Head	H, 1	H, 2	H, 3	H, 4	H, 5	H, 6
	Tail	T, 1	T, 2	T, 3	T, 4	T, 5	T, 6

There are 12 equally likely outcomes.

$$P(\text{each outcome}) = \frac{1}{12}$$

**E.g. 2** Write down the possible outcomes when **three** coins are tossed. What is the probability of each one occurring?

**Hint:** use your answer to question 2 from the starter.

**Working:** The outcomes for 2 coins are:      HH    HT    TH    TT  
Each of these can have a H or a T put in front of them:  
For HH:      HHH      THH  
For HT:      HHT      THT  
For TH:      HTH      TTH  
For TT:      HTT      TTT  
There are 8 equally likely outcomes.

Since each outcome is equally likely, the probability of each outcome is  $\frac{1}{8}$ .

**E.g. 3\*** Caitlin and Dave each buy either an Aero, Bounty, Crunchie or Dime bar. List the possible pairs of bars which Caitlin and Dave can choose. Write down the probability of each outcome.

**Working:** Let A = Aero, B = Bounty, C = Crunchie and D = Dime  
If Caitlin chooses A, Dave could choose A, B, C or D:      AA, AB, AC, AD  
If Caitlin chooses B, Dave could choose A, B, C or D:      BA, BB, BC, BD  
If Caitlin chooses C, Dave could choose A, B, C or D:      CA, CB, CC, CD  
If Caitlin chooses D, Dave could choose A, B, C or D:      DA, DB, DC, DD  
There are 16 equally likely outcomes.

Since each outcome is equally likely, the probability of each outcome is  $\frac{1}{16}$ .

**Video:**      [Listing outcomes](#)

[Solutions to Starter and E.g.s](#)

### Exercise

CIMT 8A p172 Ex 10.2 Qu 2-5, 7-10