

1. Keywords

Probability: The chance of something happening, given as a fraction, decimal or percentage.

Random: Chosen purely by chance, with no predictability.

Certain: Will definitely happen, this has a probability of 1.

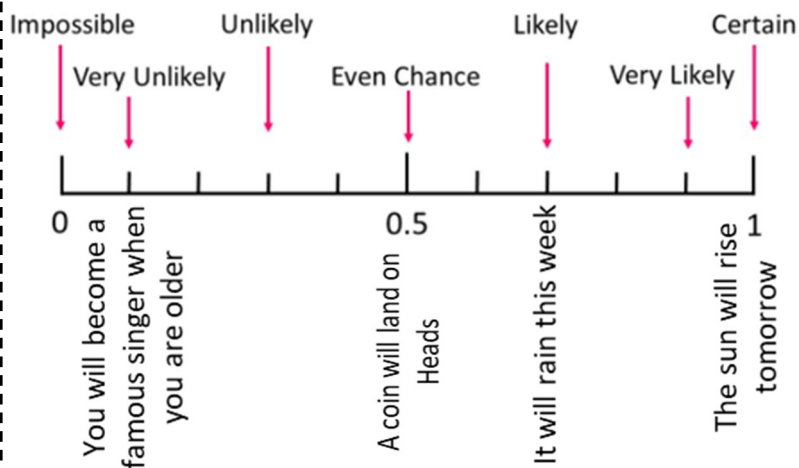
Impossible: Will definitely not happen, this has a probability of 0.

Likely: Will probably happen, but might not.

Unlikely: Probably will not happen, but just might.

Evens: Just as likely to happen as not to happen, this has a probability of 0.5.

2. The probability scale



Maths, Y9 - Probability

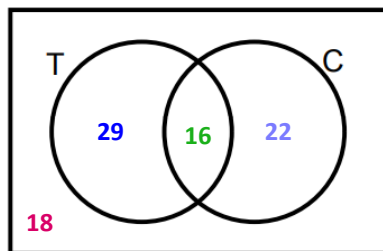
4. Venn Diagrams

85 people were asked if they liked tea and coffee.

18 people didn't like either drink

29 liked tea, but not coffee

22 liked coffee, but not tea



$$18 + 29 + 22 = 69$$

$$85 - 69 = 16 \text{ people like both}$$

What is the probability that a person likes both tea and coffee?

$$\frac{\text{Number that like both}}{\text{Number of people all together}} = \frac{16}{85}$$

5. Listing Outcomes

I have 2 coins, if I flip them I could get two heads, two tails or one of each: **HH, TT, HT, TH**

The probability of getting 2 tails is 1 out of 4, or 0.25

A spinner displays two animals at random from this selection:



What is the probability of getting a matching pair?

How many ways can the spinner stop?

Use a two way table.

Pairs of letters show the ways in which the reels can stop.

Using F for frog etc.

you can see the pairing

that are possible.

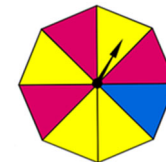
These are all of the

possible outcomes

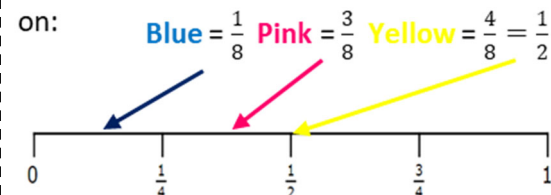
		left		
		frog	cat	dog
right	frog	FF	CF	DF
	cat	FC	CC	DC
	dog	FD	CD	DD

3. Probability of single events

There is an equal chance that the spinner will stop at each section.



Probabilities of stopping on:



7. Relative frequency

This is how we work out how **likely** events are to happen.

How likely is it for a dice to land on a 6?

I threw a dice 100 times and rolled 17 sixes.

The relative frequency of rolling a 6 on this dice was 17 out of 100, or 0.17, which is close to what I would expect.

8. Expected frequency

The table shows the probability of picking a red, green or blue pen from a pencil case.

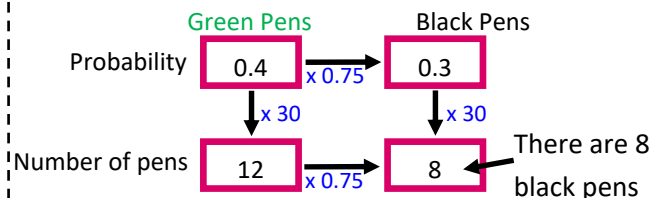
Colour	Red	Green	Blue	Black
Probability	0.1	0.4	0.2	

Find the probability of picking a black pen.

$$\text{Probabilities add to 1} \quad 0.1 + 0.4 + 0.2 = 0.7$$

$$1 - 0.7 = 0.3$$

If there are 12 green pens, how many black pens are there?



6. Probability of combined events

I roll two dice and add the scores together, here are all the possible outcomes:

There are three ways to get a 4: pink 1 blue 3, blue 1 pink 3, pink 2 blue 2. There are 36 different outcomes.

$$P(4) = \frac{3}{36}$$

The probability of scoring a 12 is $\frac{1}{36}$

The most likely score is a 7.

		pink dice					
		1	2	3	4	5	6
blue dice	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12