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Probability

Calculating probabilities

Probabilities are often written as a fraction, a decimal or a percentage eg *He has a one out of four chance of being right; I don't stand half a chance of getting it right; there's a 75% chance of rain.* In this lesson, we review how simple probabilities are calculated and written.

Lesson Outcomes

By the end of this lesson, you should be able to:

- calculate the probability of an event
- state whether the possible outcomes of a trial are equally likely to occur

Curriculum Links

LO 4: Data handling and probability

This lesson consolidates previous knowledge needed to achieve the learning outcome

Lesson Notes

Probability is normally written mathematically as a ratio or fraction:

$$\text{Probability} = \frac{\text{Number of favourable outcomes}}{\text{Number of possible outcomes}}$$

This can only be used when each of the possible outcomes has an equally likely chance of occurring (that is, none of them has an unfair advantage over the others).

So to calculate the probability of something occurring, work out the number of favourable outcomes out of the total number of possible outcomes.



Example 1: We have 4 cups each with a different brand of Cola in them, but only one of the cups has Coca Cola in it. If you taste the Cola from a cup, what is the chance that it will be Coca Cola?

There is 1 chance out of 4 chances that it will be Coca Cola. We can write this as: $\frac{1}{4}$

Suppose you test a person four times to see if they know which cup has Coca Cola in it. They guess correctly 3 times.

$\frac{3}{4} > \frac{1}{4}$, so the correct guesses are greater than the chance of a correct guess, so the person probably can really taste the difference between the brands of cola.

Example 2: We have 6 cups with different brands of Cola in them, but only three of the cups have Coca Cola in them. If you taste the Cola from a cup, what is the chance that it will be Coca Cola?

$$\begin{aligned} \text{Probability} &= \frac{\text{Number of favourable outcomes}}{\text{Number of possible outcomes}} \\ &= \frac{3}{6} \\ &= \frac{1}{2} \end{aligned}$$

Task

For each question, write down the number of possible outcomes; the number of favourable outcomes; the probability statement using a fraction.

- What is the probability of:
 - getting Tails if you flip a coin?
 - guessing the correct answer in a question with choices a, b, c or d?
 - drawing an Ace from a full pack of playing cards?
 - picking a red jelly tot from a packet of 7 yellow, 10 red and 9 green jelly tots?
- Put the probabilities of the above questions in order from lowest to highest.

