Expectation

Starter

1. **(Review of last lesson)** Jamal records the colours of the cars passing his school.

Colour	Silver	Black	Red	Blue	Other
Frequency	452	124	237	98	89

Estimate the probability, as a decimal, that the next car passing Jamal's school will be:
(a)   silver   (b)   red or blue   (c)   not red or blue

2. (a)   A coin is flipped 60 times. How many heads would you expect?
    (b)   A 6-sided dice is rolled 42 times. How many sixes would you expect?

3. Are you guaranteed to get exactly the values you stated in question 2?

Notes

For question 2 of the starter, we call the value the *expected value* because it is what we expect but not necessarily what would happen in practice.

The more trials we carried out the closer the actual number of occurrences will be to the expected number of occurrences.

$$\text{Expected occurrences} = \text{Number of trials} \times \text{Probability}$$

E.g. 1 A bag has 3 red, 4 green and 5 blue cubes. A cube is removed and replaced 72 times.
(a)   How many blue cubes would you expect to remove?
(b)   How many cubes that are not red would you expect to remove?

Working: (a) $\dfrac{5}{12} \times 72 = 30$

Relative frequency and *expectation* are closely related and can be combined in questions.

E.g. 2 Mary counted the number of cars passing her school.

Colour	Black	Red	Blue
Frequency	17	4	9

If 120 cars passed in front of the school, how many red cars would we expect to see?

Video: **Expectation**

Solutions to Starter and E.g.s

Exercise

9-1 class textbook:	p236 M8.3 Qu 1-10
A*-G class textbook:	p206 M8.3 Qu 1-10
9-1 homework book:	p80 M8.3 Qu 1-8
A*-G homework book:	p58 M8.3 Qu 1-8

Summary

$$\text{Expected occurrences} = \text{Number of trials} \times \text{Probability}$$

Homework book answers (only available during a lockdown)