D3.3 Equally likely outcomes

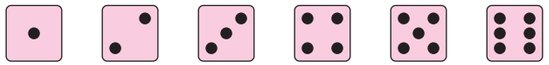
This spread will show you how to:

- List all outcomes for single events in a systematic way
- Understand and use estimates or measures of probability including equally likely outcomes

Keywords

Equally likely
Event
Outcome
Probability
Systematically

- An **event** is an activity, for example, rolling a dice.
- The possible **outcomes** are 1, 2, 3, 4, 5 and 6.



The six outcomes are drawn in order or **systematically**.

Each outcome is **equally likely** as the faces of the dice are identical in size and shape.

The **probability** is a number that measures how likely it is that an outcome will happen.

You can calculate the probability using this formula.

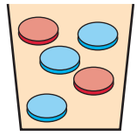
- Probability of an outcome happening $= \frac{\text{number of ways the outcome can happen}}{\text{total number of all possible outcomes}}$

All probabilities have a value between 0 and 1.

0 means impossible.
1 means certain.

Example

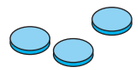
A counter is taken out of the bucket.



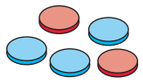
a List the possible outcomes for this event.
b Find the probability that a blue counter is taken out.
c Find the probability that a red counter is taken out.
d Find the probability that a green counter is taken out.

a Blue, Blue, Blue, Red, Red

b The number of ways of taking a blue counter is 3.
The total number of all possible outcomes is 5.
The probability of taking a blue counter is $\frac{3}{5}$.



c The number of ways of taking a red counter is 2.
The total number of all possible outcomes is 5.
Probability of taking a red counter is $\frac{2}{5}$.

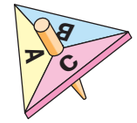


d The number of ways of taking a green counter is 0.
The total number of all possible outcomes is 5.
Probability of taking a green counter is $\frac{0}{5} = 0$.

Exercise D3.3

1 List all the possible outcomes for these events.

a spinning a coin
b spinning this spinner



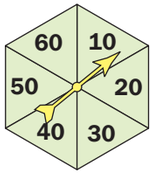
c rolling an ordinary dice
d trying to catch a ball
e picking a letter from

2 List the three possible outcomes when a ball is taken from the bag.

3 List the three possible outcomes when a ball is taken from the bag.

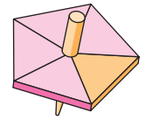
4 List the three possible outcomes when a ball is taken from the bag.

5 List the possible outcomes when the spinner is spun.



For the questions **6–10**, the outcomes are equally likely.

6 **a** Which colour is the most likely?



b Calculate the probability of spinning orange.
c Calculate the probability of spinning pink.

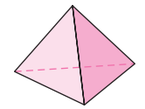
7 Calculate the probability of spinning a Head with a coin.

8 An ordinary dice is rolled. Calculate the probability of rolling

a a 3 **b** an even number **c** a 7.

9 Some children cannot decide whether to go swimming, skating or bowling. Three cards are put into a tin. One card is taken out to decide the activity.
Calculate the probability that the children go bowling.

10 A tetrahedron dice has only four faces.
The four outcomes are 1, 2, 3 or 4.
Calculate the probability that the score is



a a 3 **b** an even number **c** an odd number **d** a 5.