

4:01 The language of probability

Sample space: the set of all possible outcomes—
e.g. 1, 2, 3, 4, 5, 6, 7, 8 on an 8-sided spinner

Chance event: e.g. getting an even number on a spin

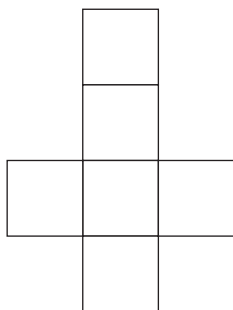
Mutually exclusive events: no elements in common—
e.g. getting a number less than three and getting a number larger than 6

Complement of an event: not getting the event—
e.g. the complement of getting an odd number is getting an even number

In a **random** chance process each outcome is **equally likely** to occur.

Relative frequency or experimental probability of an event is the fraction or percentage of times that the event occurs.

- 1 The diagram shows a net for a fair six-sided dice. Colour it in to design a three-coloured dice that is more likely to come up red than blue, and is more likely to come up blue than green.



- 2 The probability of event A is 0.125. The probability of event B is 0.4. Which event is more likely to occur?

- 3 Use one of the following words (impossible, unlikely, even chance, likely, certain) to describe events with these probabilities.

- a 0.15 _____
b 1 _____
c 0 _____
d $\frac{9}{10}$ _____
e 0.5 _____

- 4 A fair six-sided dice with faces numbered 1 to 6 is rolled. Use the words given in Question 3 to describe the chance that the top face of the dice will show:

- a a 5 _____
b a number less than 7 _____
c an even number _____
d a number greater than 2 _____
e a blank face. _____

- 5 The 52 cards in a standard pack can be coded with two or three symbols. First is the value of the card (2 to 10, Jack, Queen, King, Ace) followed by the suit (hearts, diamonds, clubs, spades). Four examples: 5D = 5 of diamonds, QH = Queen of hearts, AC = Ace of clubs, 10S = 10 of spades. Use these codes to list the cards that make up each event below:

- a a red King (red cards are hearts and diamonds)

- b a spade that is between 5 and 8 inclusive

- c a black picture card (picture cards are the Jack, Queen and King)

- d a card that is neither red nor a numbered card

- 6 Using a standard pack of 52 cards, how many cards are in each event?

- a a red picture card _____
b a black card with a number less than 8 _____
c a card that is not numbered and is not a club _____
d a card that is a diamond or a picture card but not both

- 7 In a raffle there are 1000 tickets, numbered from 1 to 1000. How many tickets have a number that is:

- a less than 101 _____
b even and higher than 200 _____
c between 400 and 500 inclusive _____
d odd or between 100 and 900 inclusive, or both? _____