Planner

Chance and probability

- Describing situations involving chance
- Identifying the possible outcomes for a situation
- Recognising when the outcomes are equally likely
- Calculating the probability of an event for equally likely outcomes

Keywords

You should know

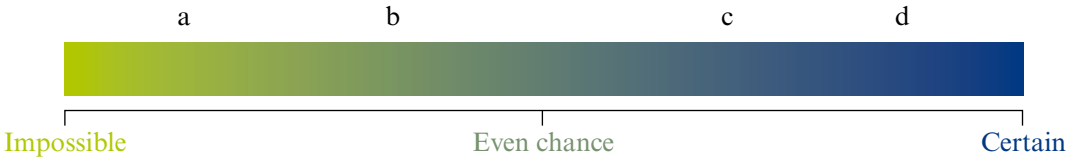
explanation 1

1 The diagram shows a scale ranging from impossible to certain.

The letters a, b, c and d are positioned on this scale to match these labels.

likely | unlikely | very unlikely | very likely

Match the letters to the labels.



2 Which of these labels best describes the likelihood of each event below?

certain | impossible | likely | unlikely | very likely | very unlikely | even chance

a You score more than 2 when you roll an ordinary dice.

b A stone thrown up into clear air will fall back down.

c You will correctly guess the answer to a multiple choice question with 3 options.

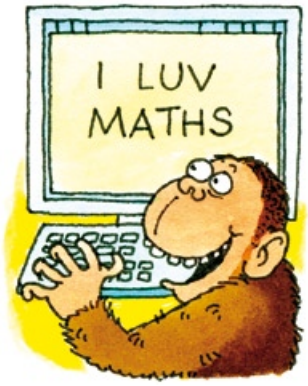
d The winner of a television quiz show is a woman.

e One day you will win the jackpot in the lottery.

f A monkey will spell out I LUV MATHS when playing with a keyboard.

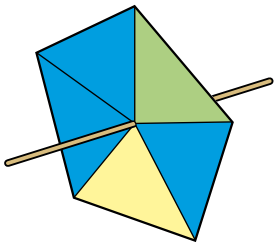
g A world record will be broken at the next Olympics.

h You score 7 when you roll an ordinary dice.



3 Arrange these outcomes in order from the least likely to the most likely.

This spinner lands on blue.
A coin lands heads up.
This spinner lands on green.
A dice is rolled and gives a score of 3.



4 Describe the chances of these outcomes as better than even or less than even.

a You correctly guess a person's favourite colour.

b A learner driver passes their driving test on the first attempt.

c At least one goal is scored in a selected football match.

d The next person to enter the room is right-handed.

Around 43% of people pass their driving test first time.

explanation 2 — online

5 At the start of his mind-reading act, Alfonso turns his back on the audience and throws a teddy bear over his shoulder.

The person who catches the teddy bear is then invited onto the stage to take part in the act.

a Why doesn't Alfonso just ask for a volunteer?

b Why doesn't he face the audience to throw the teddy bear?

c Do you think that selecting a person this way will give Alfonso any unfair advantage?

6 Here are some of the ways of selecting one person from a group of people.

- Pick the tallest.
- Pick the one whose surname is first alphabetically.
- Write each name on a piece of paper and choose one without looking.
- Pick the one that you like the most.

a Which one of these is the only way to select a person at random?

b What precaution would you take to make sure that the selection was fair?

7 A normal dice is rolled. List the outcomes for each of these events.

a An odd number is scored.

b A prime number is scored.

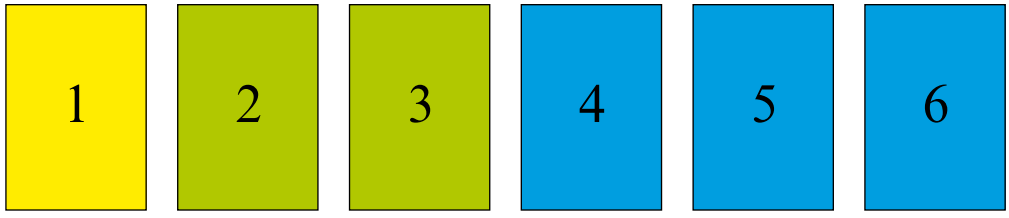
c The score is less than 5.

d The score is not less than 5.

e The score is greater than 5.

f At least 2 is scored.

8 A card is selected at random from these coloured digit cards.



Write down the number of outcomes for these events.

a The number on the card is at least 4.

b The card is blue.

c The card is not yellow.

d The card is blue and the number is even.

e The card is not green and the number is odd.

f The number on the card is neither even nor prime.

explanation 3 online

9 **a** How many outcomes are there for this spinner?

b How many of these outcomes are green?

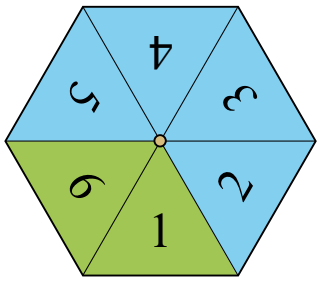
c Find the probability that the spinner lands on

i green

ii blue

iii any number apart from 4

iv a blue odd number.



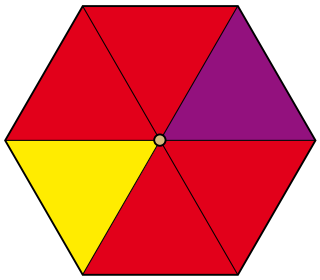
10 Find the probability that this spinner lands on

a red

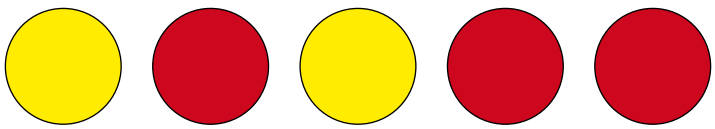
b purple

c either red or purple

d any colour apart from red.



11 These counters are put into a bag and one is selected at random.



a How many outcomes are there in total?

b How many of the outcomes are red?

c What is the probability that the counter selected is red?

d How many of the outcomes are red or yellow?

e What is the probability that the selected counter is red or yellow?

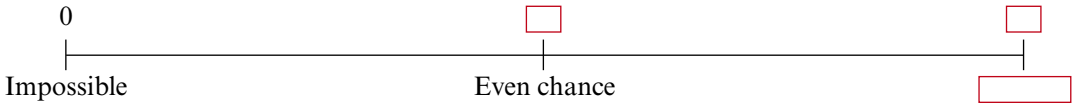
f How many of the counters are green?

g What is the probability that the selected counter is green?

12 **a** What is the probability of an event that is certain to happen?

b What is the probability of an event that cannot happen?

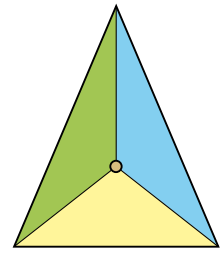
13 Copy this probability scale and fill in the blank labels.



14 This triangular spinner has 3 possible outcomes.

Simon says that 1 outcome out of 3 is yellow so the probability that the spinner lands on yellow is $\frac{1}{3}$.

Do you think that Simon is right? Explain your answer.



15 A bag contains 3 red counters and 2 blue counters. The counters are identical apart from their colour. One counter is selected at random.

a Write the probability that the counter is red in three ways:

i as a fraction **ii** as a decimal **iii** as a percentage

b Write the probability that the counter is either red or blue as a percentage.

c What is the probability that the counter is pink?

16 A bag contains 3 cabbages and 2 bars of chocolate. Katie can select one item from the bag without looking. John says that the probability that Katie selects a bar of chocolate is 40%.

a How has John worked out his answer?

Do you think he is right?

b What do you think is a more realistic value?

17 The local weather forecast gives the probability that it will rain today as 25%.

What is the probability that it will not rain here today?

18 20% of the cars in a car park are red. One quarter of the cars are blue.

A car in the car park is selected at random.

a What is the probability, as a fraction, that the car is red?

b What is the probability, as a decimal, that the car is either red or blue?

c What is the probability, as a percentage, that the car is neither red nor blue?