Pupils should be taught to:	As outcomes, Year 7 pupils should, for example:
Understand and use the probability scale; find and justify theoretical probabilities (continued)	**Identify all the possible outcomes of a single event.**

For example:

• What are the possible outcomes…

  a. when a fair coin is tossed?
  There are two outcomes: heads or tails.
  The probability of each is ½.

  b. when a letter of the alphabet is chosen at random?
  There are two outcomes: a vowel or a consonant.
  The probability of a vowel is $\frac{5}{26}$.
  The probability of a consonant is $\frac{21}{26}$.

  c. when a letter from the word HIPPOPOTAMUS is picked at random?
  There are nine outcomes: H, I, P, O, T, A, M, U, S.
  The probability of H, I, T, A, M, U or S is $\frac{1}{12}$.
  The probability of O is $\frac{2}{12}$ or $\frac{1}{6}$.
  The probability of P is $\frac{3}{12}$ or $\frac{1}{4}$.

  d. when a number is chosen at random from the set of numbers 1 to 30?
  There are two outcomes:
  prime ($\frac{11}{30}$) or non-prime ($\frac{19}{30}$).
  or:
  There are two outcomes:
  odd ($\frac{15}{30}$ or ½) or even ($\frac{15}{30}$ or ½).
  or:
  There are three outcomes:
  a number from 1–10 ($\frac{10}{30}$ or $\frac{1}{3}$),
  a number from 11–20 ($\frac{10}{30}$ or $\frac{1}{3}$),
  a number from 21–30 ($\frac{10}{30}$ or $\frac{1}{3}$).
  and so on.

Link to problems involving probability (pages 22–3).

Find and record all possible outcomes for single events and two successive events in a systematic way, using diagrams and tables.
For example:

• A coin can land in two ways:
head up (H) or tail up (T).

Throw a coin twice.	H	H
Record the four possible ways	H	T
that the coin can land	T	H
in two throws.	T	T

• What are the possible outcomes when:
   a. a mother gives birth to twins?
   b. a glazier puts red, green or blue glass in each of two windows?
   c. you can choose two pizza toppings from onion, mushroom and sweetcorn?

• One red and one white dice are numbered 1 to 6. Both dice are thrown and the scores added. Use a sample space to show all possible outcomes.

Which score is the most likely? Why?

Using the sample space, what is the probability of:
   a. getting the same number on both dice?
   b. the sum of the numbers being less than 4?
   c. the score on the red dice being double the score on the white dice?

• 200 raffle tickets are numbered from 1 to 200. They have all been sold. One ticket will be drawn at random to win first prize.
   a. Karen has number 125.
      What is the probability that she will win?
   b. Andrew buys tickets with numbers 81, 82, 83, 84. Sue buys tickets numbered 30, 60, 90, 120. Who has the better chance of winning? Why?
   c. Rob buys several tickets. He has a 5% chance of winning. How many tickets has he bought?
   d. Three people have each lost a ticket and do not play. What is the chance that nobody wins?
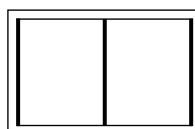
Link to problems involving probability (pages 22–3).

Identify all the mutually exclusive outcomes of an experiment.

For example:

• A fair coin and a fair dice are thrown.
One possible outcome is (tail, 5).
List all the other possible outcomes.

• A fruit machine has two 'windows'.
In each window, one of three different fruits is equally likely to appear.

strawberries   bananas   apples
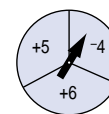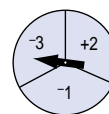
List all the possible outcomes.

What is the probability of getting:
   a. two identical fruits?
   b. at least one banana?
   c. no bananas?

• Two coins are thrown at the same time. There are four possible outcomes:
   HH   HT   TH   TT
How many possible outcomes are there if:
   a. three coins are used?
   b. four coins are used?
   c. five coins are used?

• The hands on these two spinners are spun at the same time.

The two scores are added together.
What is the probability that the total score is negative?

• A game involves rolling 6 dice. If you get 6 sixes you win a mountain bike.
What is your chance of winning the bike?

Link to problems involving probability (pages 22–3).