

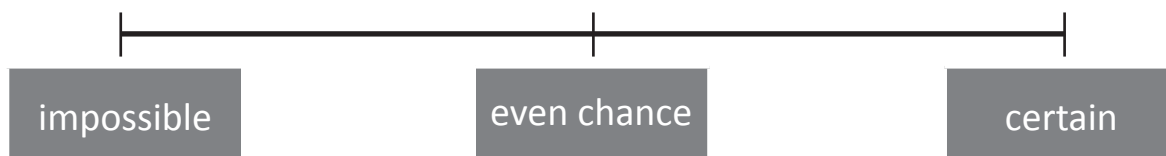
Chance – ordering events

Chance is the likelihood of something happening.

If something will definitely happen, we say it is certain.

If something has an even chance of happening, it means that it is just as likely to happen as it is unlikely to happen.

If something can't happen it is impossible.



1 Read each statement and circle the chance of it happening:

	Event	Chance
a	A baby is born a girl.	impossible / even / certain
b	Christmas Day will fall on December 25 this year.	impossible / even / certain
c	A coin is tossed and the result is a tail.	impossible / even / certain
d	6 red counters are placed in a bag and a yellow one is drawn.	impossible / even / certain

2 Draw a line to match each spinner to the correct statement:



There is an even chance that this spinner will land on stripes.

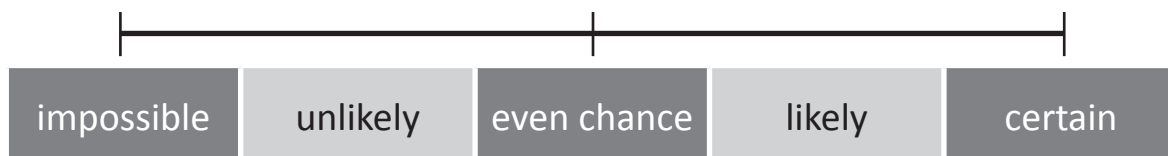


It is certain that this spinner will land on stripes.

Chance – ordering events

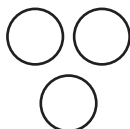
If something might happen, we say it is likely.

If something might not happen, we say it is unlikely. These two zones fit between like this:

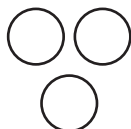


- 3** Poppy bought a box of lollies and tipped them out on her desk. Colour them in and answer the questions below:

yellow



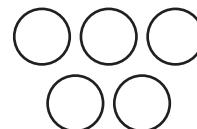
blue



red



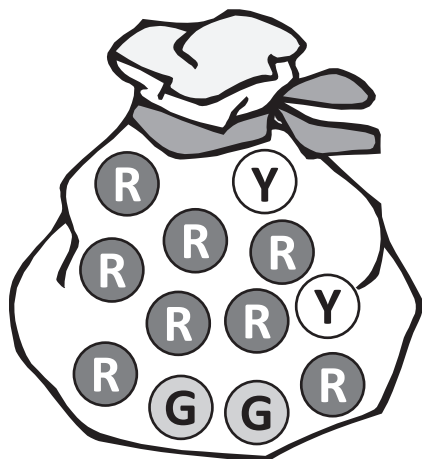
green



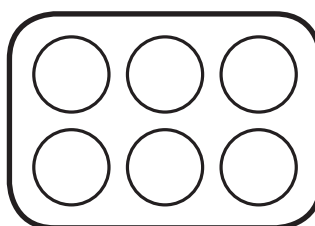
- a If she put them all into a bowl and took one without looking, which colour would she be most likely to pick? _____
- b Which colour would be least likely to be picked? _____
- c The 2 colours that have an even chance of being picked are: _____ and _____

- 4** Sam and Charlie played a game of bingo. In this game, the players had to fill each space on their board with either R for red, G for green or Y for yellow.

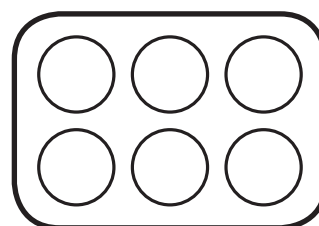
Next, coloured marbles were drawn out of the bag shown below and then replaced. If either player had the colour on their board, they could tick it. The winner was the player who got 6 ticks first. Charlie won the game. Show what each board could have looked like, before they started ticking.



Charlie's board



Sam's board



Chance – probability

Probability is the measure of how likely something is to happen.

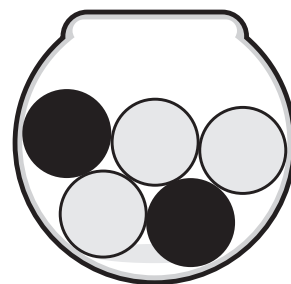
Look at the bowl of balls.

The expected probability of choosing a black ball is 2 out of 5.

This is because out of 5 possible balls that could be chosen, 2 are black.

However, expected results can be different to actual results.

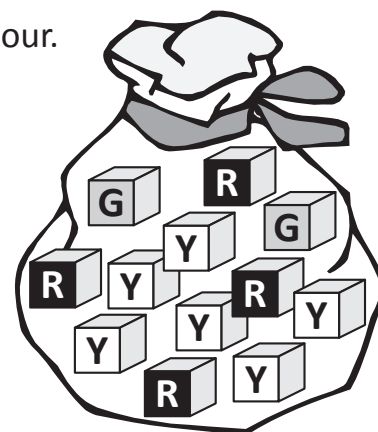
For instance if we chose a ball without looking 5 times and it was black each time, this would be surprising, but not impossible.



1 Place the following cubes in a bag: 4 red, 6 yellow and 2 green.

a Record the expected probability of choosing each colour.

Colour	Probability
Red	4 out of 12
Yellow	
Green	



b If I chose a cube 12 times and it was green each time, would this be surprising?

Yes / No

2 Let's look at what actually happens. Use the cubes from question 1.

a Without looking, choose a cube and record its colour by placing a tick next to the colour in the table below. Repeat twelve times and record the result.

Colour	1	2	3	4	5	6	7	8	9	10	11	12
Red												
Yellow												
Green												

b Was there much difference between what you expected to happen and what actually happened?

Chance – probability

- 3 Spin it!** This is an investigation where you are going to make two spinners and look at the chance of the arrow landing on certain colours.



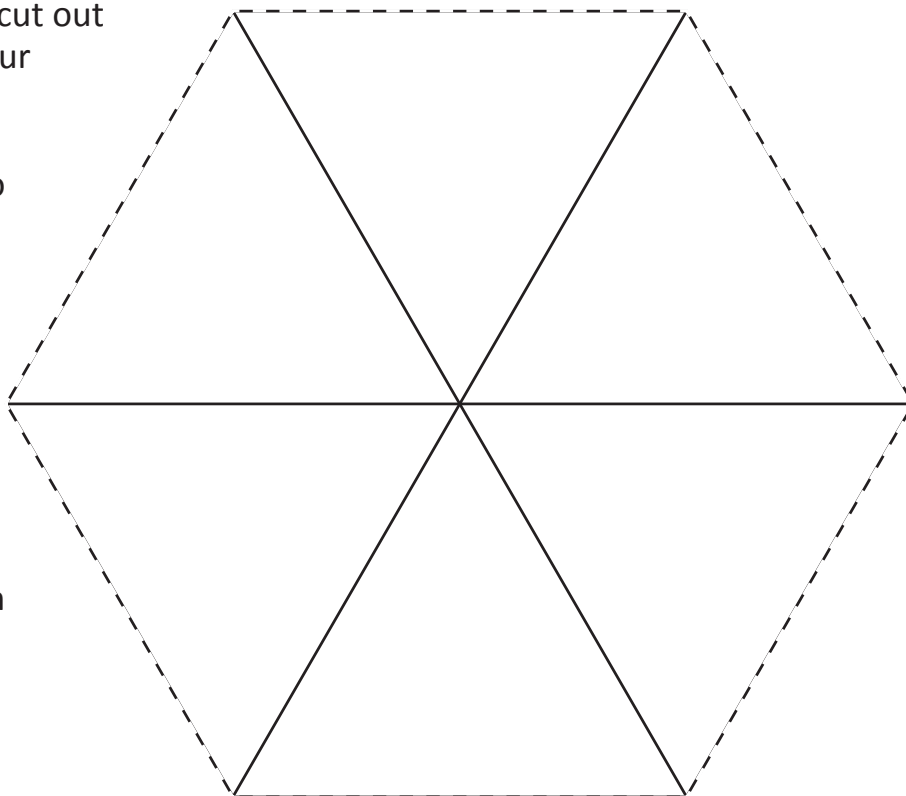
- a** For this activity you will need to copy this page and cut out the spinners. Make your spinners firmer than a regular piece of paper either by copying onto cardboard or pasting together several sheets of scrap paper.

- b** Colour Spinner 1 so:
- 2 sections are red
 - 4 sections are blue.

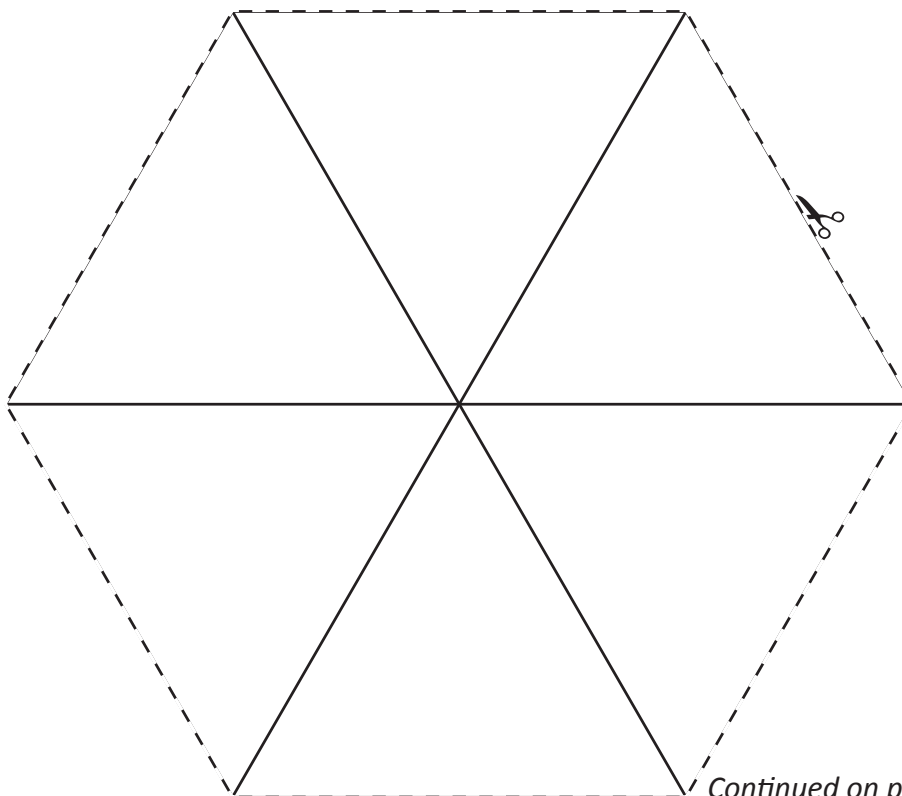
- c** Colour Spinner 2 so:
- 2 sections are green
 - 1 section is red
 - 3 sections are blue.

- d** Push a pencil through the middle so you can spin the spinner.

Spinner 1



Spinner 2



Continued on page 5.

Chance – probability

Continued from page 4.

- e Now you can begin the investigation. First, let's make some predictions based upon the expected probability.

Spinner 1	
Colour	Probability
red	2 out of 6
blue	
Most likely colour is _____	
Least likely colour is _____	

Spinner 2	
Colour	Probability
green	2 out of 6
red	
blue	
Most likely colour is _____	
Least likely colour is _____	

- f Now spin each spinner 12 times and tick to record the colour each spinner landed on:

Results for Spinner 1

	1	2	3	4	5	6	7	8	9	10	11	12
red												
blue												

Results for Spinner 2

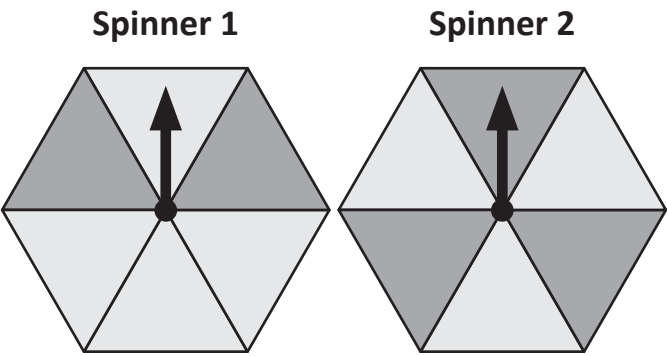
	1	2	3	4	5	6	7	8	9	10	11	12
green												
red												
blue												

- g What was expected about your results?

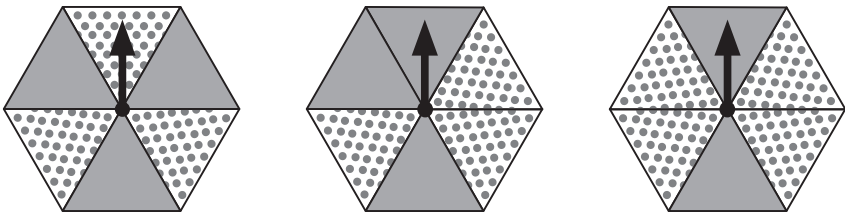
- h What was surprising about your results?

Chance – fair and unfair

When everyone has the same chance of winning a game, it is fair. When there is not the same chance for everyone to win, the game is unfair. Look at these spinners. If landing on black scores 1 point, then these spinners are unfair because there is a greater chance of landing on black with Spinner 2 than there is with Spinner 1.



- 1 Bec and Drew are about to play a game where if their spinner lands on dots, they score 1 point.



- a Put a ring around the 2 spinners they should use for this game so it is fair.
- b Cross out the unfair spinner.
- c Why is the spinner that you crossed out unfair?

- 2 For this activity, you will need to look at a die.

- a Complete this table to show the chance of rolling certain numbers:

Number rolled	Probability
A 2	1 out of 6
An odd number	
An even number	
A number greater than 4	

- b Tom invents a game where if a die lands on an odd number you win a point and if the die lands on a number greater than 4 you win a point. Is this game fair? Why or why not?

Chance – coin investigation

If we toss 2 coins, we can expect 4 possible outcomes.

		Coin 1	
		H	T
Coin 2	H	HH	HT
	T	TH	TT



If we use a table to show the possible outcomes of tossing 2 coins 4 times, we would expect it to look like this:

		Possible outcomes			
		TT	TH	HH	HT
Toss	1				✓
	2			✓	
	3		✓		
	4	✓			



Would it be possible for the coins to land on HH 4 times? Yes it would, however, it would be a surprising result.

1 Complete these experiments:

a Toss 2 coins 8 times and show the results on this table:

		Possible outcomes			
		TT	TH	HH	HT
Toss	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				

b Repeat this experiment again, and show the results on this table:

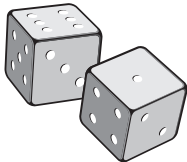
		Possible outcomes			
		TT	TH	HH	HT
Toss	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				

c Were your results in question **a** and **b** surprising? Why or why not?

Chance – two dice investigation

We can work out all the possible outcomes of an event.
When we looked at what we could expect to happen when we tossed two coins, we saw that there are four possible outcomes.
What can we expect to happen when we roll two dice and add the numbers?

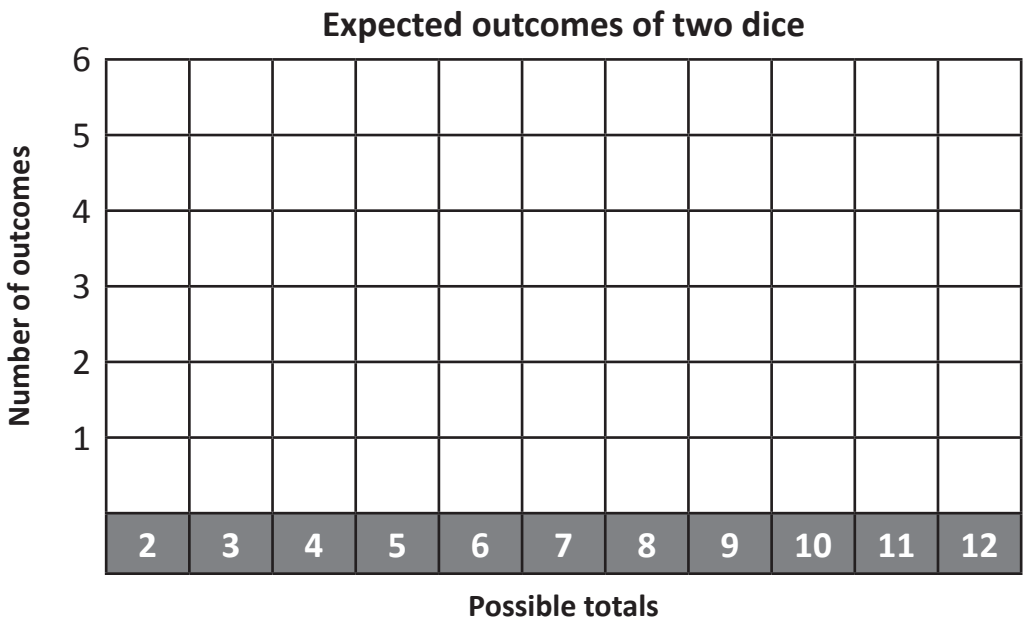
1 Fill in this table to show the possible outcomes when two dice are rolled and added together.



+	1	2	3	4	5	6
1	2					
2		4				
3						
4						
5						
6						

a How many possible outcomes are there?

b Graph the expected outcomes in the grid below:



c The chance of rolling a 7 is _____ out of 36.

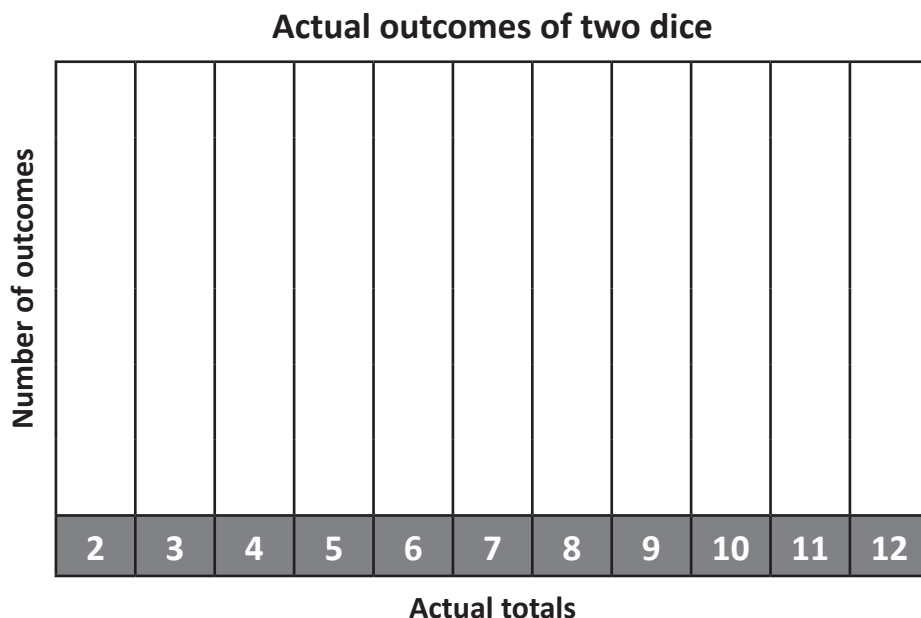
d The chance of rolling a 2 is _____ out of 36.

Continued on page 9.

Chance – two dice investigation

Continued from page 8.

- e Now see what happens in real life. Work with a partner. Roll two dice 36 times. When an actual total comes up, tick the column.



Probability is the measure of how likely something is to happen but things don't always turn out exactly as we would expect.



- f Look at difference between the 'Expected outcomes' graph (on page 8) and the 'Actual outcomes' graph (above). What happened? Were the actual outcomes surprising?

- 2 Three kids were playing a bingo game where if you rolled two dice and added the numbers, you can cross out a number if it's on the bingo card. Put a ring around the card that you would expect to win.

2	4
3	5

9	10
12	11

7	5
6	8



This is a game for two players. Each player will need two dice, 12 counters and a copy of pages 10 and 11.



The object of this game is to be the first player to release all of the prisoners. Each player places all 12 counters (these are the prisoners) in the prison cells numbered 2–12. There can be any amount of prisoners in a cell.

Player 1 rolls the dice, adds the numbers and removes the prisoners from that cell. They must record the dice total they rolled by ticking the column on the recording grid after each turn.

Player 2 repeats this process. The winner is the player who releases all of their prisoners first.

Recording grid

2	3	4	5	6	7	8	9	10	11	12

Total of dice



Play this game several times. Look at the numbers that have the most ticks. How can this help you place your counters better next time so that you have more chance of winning? Or is there a better way to find out expected outcomes for the total of the dice?

