

Describing Chance

WALT: Understand and describe chance

Success Criteria I can...

- Describe the 'chance' or 'likelihood' of outcomes happening
- Describe the likelihood of an event as a fraction or percentage

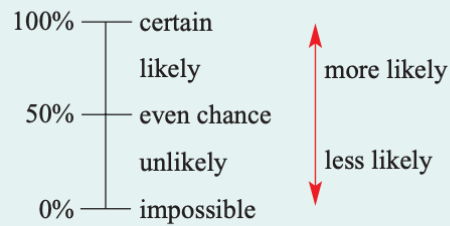
▶ Let's start: Likely or unlikely?

Try to rank these events from least likely to most likely. Compare your answers with other students in the class.

- It will rain tomorrow.
- Australia will win the soccer World Cup.
- Tails will land on top when a 20-cent coin is tossed.
- The king of spades is at the top of a shuffled deck of 52 playing cards.
- A diamond card is at the bottom of a shuffled deck of 52 playing cards.
- The sun will rise tomorrow.

Teacher discussion

- There are a number of words and phrases we can use to describe **chance**.



Chance The likelihood of an event happening

- If two events have the same chance of occurring, we say they are equally likely.

Answer the following questions

- Fill in each blank with the word *likely* or *unlikely*.
 - A fair coin is flipped 100 times. It is _____ that these will be 100 tails.
 - A page of this book is picked at random. It is _____ that the letter 'e' will be on the page.
 - The television is switched on at 5 pm and left on for 3 hours. It is _____ that the News will be shown at some stage.
 - It is _____ that the next Australian prime minister will be 21 years old.
- Match each of the events (**a** to **d**) with a description of how likely they are to occur (**A** to **D**).

a A tossed coin landing heads up	A unlikely
b Selecting an ace first try from a fair deck of 52 playing cards	B likely
c Obtaining a number other than 6 if a fair 6-sided die is rolled	C impossible
d Obtaining a number greater than 8 if a fair 6-sided die is rolled	D even chance

Say whether each of the following statements is true or false.

- a** It is likely that children will go to school next year.
- b** It is an even chance for a fair coin to display tails.
- c** Rolling a 3 on a 6-sided die and getting heads on a coin are equally likely.
- d** It is certain that two randomly chosen odd numbers will add up to an even number.

Solution

Explanation

- | | |
|----------------|---|
| a true | Although there is perhaps a small chance that the laws might change, it is (very) likely that children will go to school next year. |
| b true | There is a 50-50 or even chance of a fair coin displaying tails. It will happen, on average, half of the time. |
| c false | These events are not equally likely. Flipping heads on a coin is more likely than rolling a 3 on a 6-sided die. |
| d true | No matter what odd numbers are chosen, they will always add to an even number. |

- 3** Consider a fair 6-sided die with the numbers 1 to 6 on it.

Say whether each of the following is true or false.

- a** Rolling a 3 is unlikely.
- b** Rolling a 5 is likely.
- c** Rolling a 4 and rolling a 5 are equally likely events.
- d** Rolling an even number is likely.
- e** There is an even chance of rolling an odd number.
- f** There is an even chance of rolling a multiple of 3.



4 Copy and complete the following, using the special words that describe chance.

- a If an event is guaranteed to occur, we say it is _____.
- b An event that is equally likely to occur or not occur has an _____ _____.
- c A rare event is considered _____.
- d An event that will never occur is called _____.

5 Match each of the events (a to d) with an equally likely event (A to D).

- | | |
|---|---|
| a Rolling a 2 on a 6-sided die | A Flipping a coin and heads landing face up |
| b Selecting a heart card from a fair deck of 52 playing cards | B Rolling a 5 or a 6 on a 6-sided die |
| c Flipping a coin and tails landing face up | C Selecting a diamond card from a fair deck of 52 playing cards |
| d Rolling a 1 or a 5 on a 6-sided die | D Rolling a 4 on a 6-sided die |

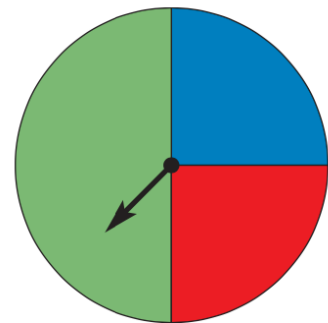


6 Give an example of:

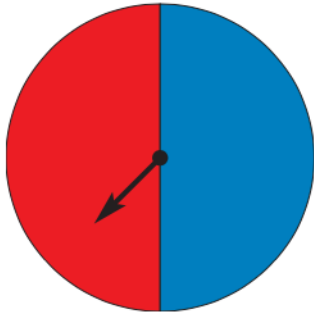
- | | |
|---|--------------------------------------|
| a an event that is unlikely | b an event that is likely |
| c an event that has an even chance of occurring | d two events that are equally likely |

7 This spinner could land with the arrow pointing to any of the three colours.

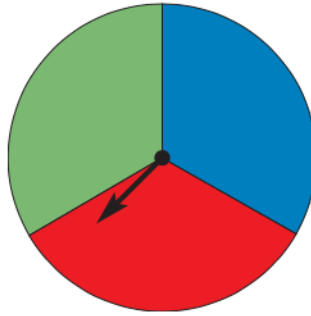
- a State whether each of the following is true or false.
 - i There is an even chance that the spinner will point to green.
 - ii It is likely that the spinner will point to red.
 - iii It is certain that the spinner will point to purple.
 - iv It is equally likely that the spinner will point to red or blue.
- b Use the spinner to give an example of:
 - i an impossible event
 - ii a likely event
 - iii a certain event
 - iv two events that are equally likely



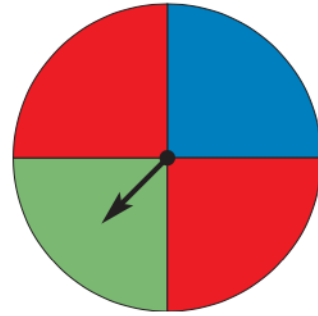
8 Three spinners are shown below. Match each spinner with the description.



spinner 1



spinner 2



spinner 3

- a Has an even chance of red, but blue is unlikely.
- b Blue and green are equally likely, but red is unlikely.
- c Has an even chance of blue, and green is impossible.

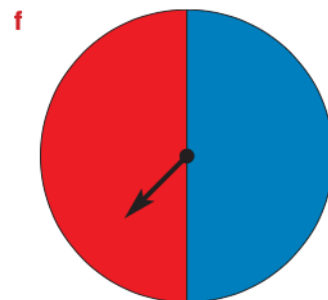
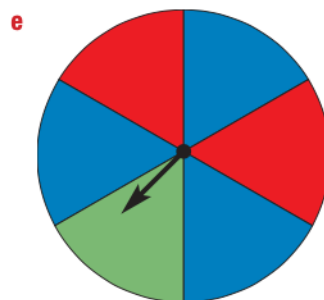
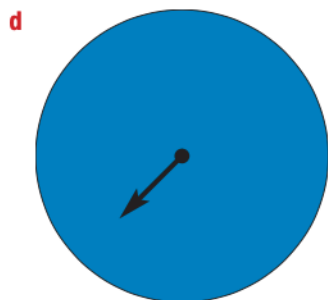
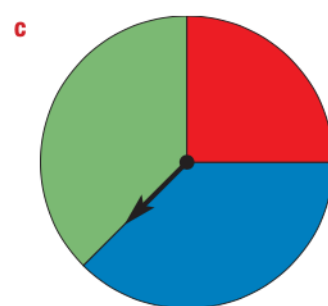
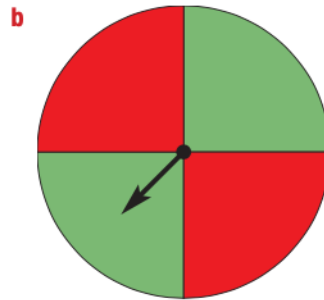
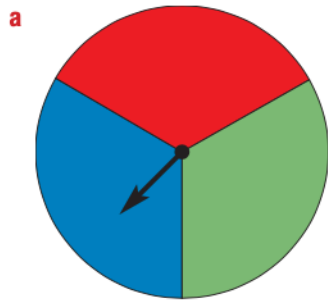
9 Draw spinners to match each of the following descriptions.

- a Blue is likely, red is unlikely and green is impossible.
- b Red is certain.
- c Blue has an even chance, red and green are equally likely.
- d Blue, red and green are all equally likely.

Blue, red and green are the only possible colours.



10 For each of the following, describe the chances involved so that someone else could draw the spinner. Use colour names and the language of chance (e.g. *likely*, *impossible* etc.) in your descriptions.

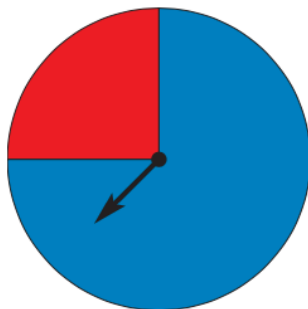


--Extension

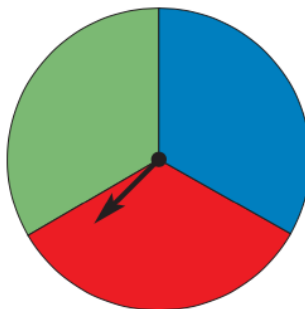


Spinner fractions

- 11** The language of chance is a bit vague. For example, for both of the following spinners it is 'unlikely' that you will spin red, but in each case the chance of spinning red is different.



spinner 1



spinner 2

Rather than describing chance in words, we could consider the fraction of the spinner for a certain colour.

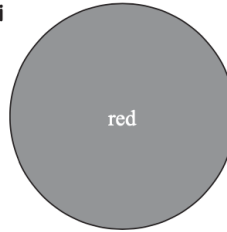
- a** What fraction of spinner 1 is red?
- b** What fraction of spinner 2 is red?
- c** What fraction of a spinner would be red if red had an even chance?
- d** Draw spinners for which red makes up:
 - i** 100% of the spinner
 - ii** 0% of the spinner
- e** For the sentences below, fill each gap with an appropriate fraction or percentage value.
 - i** You have an even chance of spinning a certain colour if it makes up _____ of the total spinner.
 - ii** It is impossible to spin a certain colour if it makes up ____% of the total spinner.
 - iii** You are unlikely to spin a certain colour if it makes up more than _____ but less than _____ of the total area.
 - iv** You are likely to spin a certain colour if it makes up more than _____ of the total area.
- f** How can the fractions help determine if two events are equally likely?

Check your answers

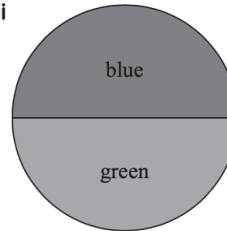
- 1 a unlikely b likely c likely d unlikely
- 2 a D b A c B d C
- 3 a true b false c true
d false e true f false
- 4 a certain b even chance c unlikely d impossible
- 5 a D b C c A d B
- 6 Answers will vary.
- 7 a i true ii false iii false iv true
b i spinner landing on yellow
ii spinner not landing on red
iii spinner landing on green, blue or red
iv spinner landing on blue or on red
- 8 a spinner 3 b spinner 2 c spinner 1
- 9 Answers will vary.
- 10 a Blue, red and green equally likely.
b Red and green both have an even chance.
c Green and blue equally likely, red and blue are not equally likely.
d Blue is certain.
e Blue, red and green all possible, but no two colours are equally likely.
f Red and blue both have an even chance.

11 RED AND BLUE BOTH HAVE AN EVEN CHANCE.

- 11 a $\frac{1}{4}$ b $\frac{1}{3}$ c $\frac{1}{2}$
d i



ii



Other answers possible.