

Year 6 SATs Booster

Maths 7

Probability

Objectives:

- Understand and use the probability scale
- Find and justify theoretical probabilities

Vocabulary:

certain

unlikely

likely

even chance

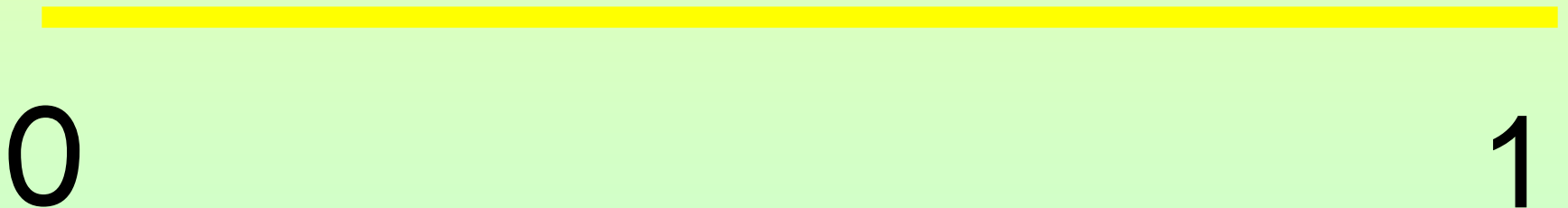
impossible

What is probability?

Probability or chance is how likely something is to happen: If something has a low probability, it is unlikely to happen.

If something has a high probability, it is likely to happen.

Probabilities can be shown on a scale between 0 (impossible) and 1 (certain).



If I had no air and water for a year, what is the probability that I would live?

A single 6-sided die is rolled. What is the probability of rolling a number less than 7?



Flipping a coin and getting heads?



0



1

If I had no air and water for a year, what is the probability that I would live?

A single 6-sided die is rolled. What is the probability of rolling a number less than 7?



Flipping a coin and getting heads?



0%



100%

If I had no air and water for a year, what is the probability that I would live?

A single 6-sided die is rolled. What is the probability of rolling a number less than 7?



Flipping a coin and getting heads?

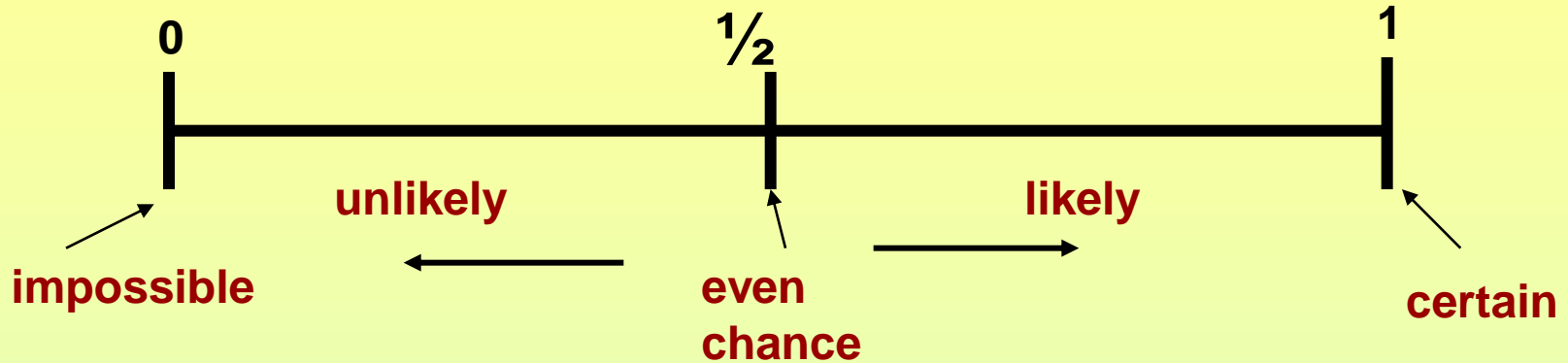


0/10



10/10

The Probability Scale



certain The day following Tuesday will be Wednesday.

impossible You will get a seven when you throw a dice. (1 to 6)

even chance You will pick a red card from a pack of 52 playing cards.

unlikely You will get a six when you throw a dice. (1 to 6)

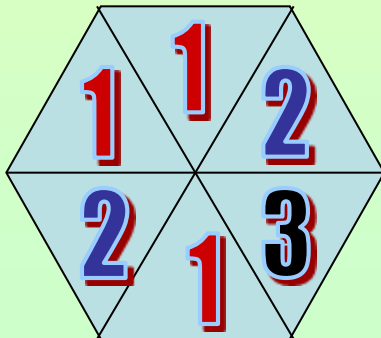
likely You will get a factor of six when you throw a dice. (1 to 6)

Questions:

1. There are ten balls in a bag 3 red, 2 blue, and 5 green.
 - a. Which colour is most likely to be picked? Why?
 - b. Which colour is least likely to be picked? Why?

2. In a class of 13 boys and 15 girls, one child is chosen (at random) each day to take the register to the office.
 - a. Is the child more likely to be a boy or a girl?
 - b. On a Tuesday, 2 girls are absent. Is a girl more, less or evenly likely to be chosen on this day?

3. To play a game you spin the pointer below:



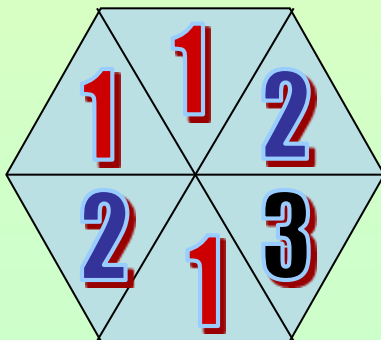
- a. Which score is least likely?
- b. Which score has an even chance of occurring?

Answers:

1. There are ten balls in a bag 3 red, 2 blue, and 5 green.
 - a. Which colour is most likely to be picked? Why? Green – more of them than any other colour
 - b. Which colour is least likely to be picked? Why? Blue – less of them than any other colour

2. In a class of 13 boys and 15 girls, one child is chosen (at random) each day to take the register to the office.
 - a. Is the child more likely to be a boy or a girl? More likely to be a girl because there are more girls than boys
 - b. On a Tuesday, 2 girls are absent. Is a girl more, less or evenly likely to be chosen on this day? Evenly likely because there are the same number of boys and girls.

3. To play a game you spin the pointer below:



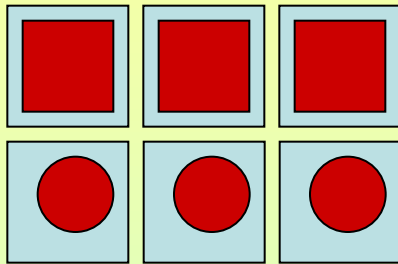
- a. Which score is least likely? 3 is least likely
- b. Which score has an even chance of occurring? 1 has an even chance of occurring.

A class is going to play three games. In each game some cards are put into a bag. Each card has a square or circle on it. One card will be taken out of the bag, then put back.

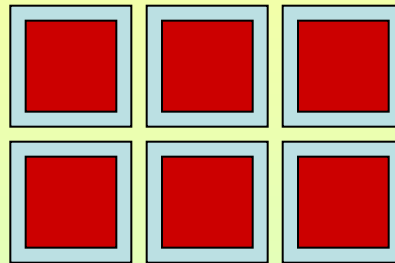
If it is a circle the girls will get a point.

If it is a square the boys will get a point.

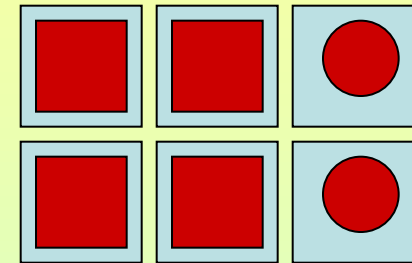
game 1



game 2



game 3



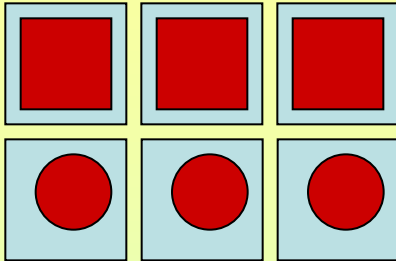
- Which game are the girls most likely to win? Why?
- Which game are the boys most likely to win? Why?
- Which game is impossible for the girls to win?
- Which game are the boys certain to win?
- Which game is it equally likely that the boys or girls win?
- Are any of the games unfair? Why?

Answers

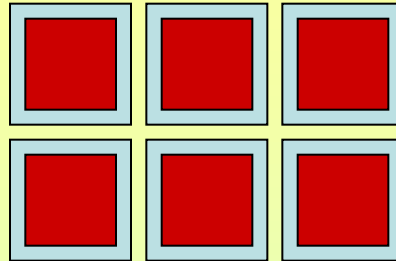
If it is a circle the girls will get a point.

If it is a square the boys will get a point.

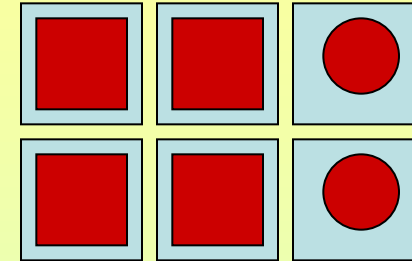
game 1



game 2



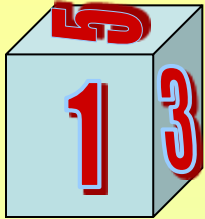
game 3



- Which game are the girls most likely to win? Why? Game 1 – most circles in the game
- Which game are the boys most likely to win? Why? Game 2 – boys certain to win
- Which game is impossible for the girls to win? Game 2
- Which game are the boys certain to win? Game 2
- Which game is it equally likely that the boys or girls win? Game 1
- Are any of the games unfair? Why?

Game 2 is unfair – the girls cannot possibly win.

Game 3 is unfair - the boys have twice as much chance as the girls for winning



When throwing a fair dice the different outcomes are: 1, 2, 3, 4, 5 or 6.

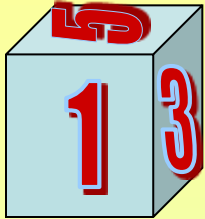
These outcomes are equally likely.

The probability of rolling a 2 on a fair dice is $\frac{1}{6}$

What is the probability of rolling:

- a. 5?
- b. an odd number?
- c. zero?
- d. a number greater than 2?
- e. a prime number?
- f. a number lying between 0 and 7?

Answers



When throwing a fair dice the different outcomes are: 1, 2, 3, 4, 5 or 6.

These outcomes are equally likely.

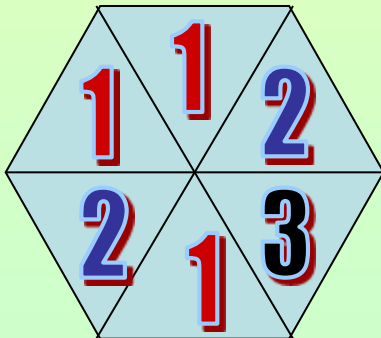
The probability of rolling a 2 on a fair dice is $\frac{1}{6}$

What is the probability of rolling:

- a. 5? $\frac{1}{6}$
- b. an odd number? $\frac{1}{2}$
- c. zero? 0
- d. a number greater than 2? $\frac{2}{3}$
- e. a prime number? $\frac{1}{2}$
- f. a number lying between 0 and 7? 1

Questions:

- The letters in the word **RABBIT** are placed in a tub, and a letter taken at random. What is the probability of taking out:
 - a letter **T**?
 - a letter **B**?
- The 26 letters of the alphabet are placed face down on a table. A letter is chosen at random. What is the probability of choosing
 - a vowel?
 - a consonant?
- The pointer below is spun. What is the probability of scoring:



- 1** ?
- 2** ?
- 3** ?
- A prime number?
- A square number?

Answers:

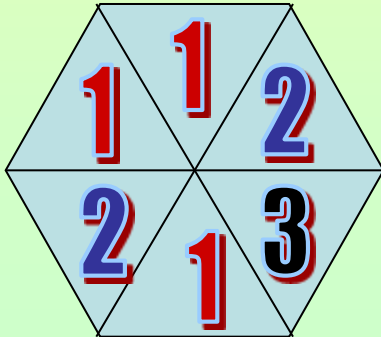
1. The letters in the word **RABBIT** are placed in a tub, and a letter taken at random. What is the probability of taking out:

- a. a letter **T**? $\frac{1}{6}$ b. a letter **B**? $\frac{2}{3}$

2. The 26 letters of the alphabet are placed face down on a table. A letter is chosen at random. What is the probability of choosing

- a. a vowel? $\frac{5}{26}$ b. a consonant? $\frac{21}{26}$

3. The pointer below is spun. What is the probability of scoring:



- a. 1 ? $\frac{1}{2}$
b. 2 ? $\frac{1}{3}$
c. 3 ? $\frac{1}{6}$
d. A prime number? $\frac{1}{2}$
e. A square number? $\frac{1}{2}$