

Probability: what is it all about?



Objectives:

- to understand the concept/idea of chance
- to be able to estimate chance using prior knowledge

Objectives:

- to understand the concept/idea of chance/probability
- to be able to estimate chance/prbability using prior knowledge

Some of the language of probability:

perhaps, **might**, likely, **unlikely**, equally
likely, chance, **certain**, uncertain,
probable, possible, , good chance, **poor**
chance, no chance, **equal chance**, even
chance, evens, **fifty- fifty**, likelihood,
probability, **possibility**, fair, **unfair**,.

Objectives:

- to understand the concept/idea of chance
- to be able to estimate chance using prior knowledge



Calculating Probabilities

If you can calculate probabilities, you can use this simple method:

$$\text{The probability of an event happening} = \frac{\text{The number of results you want}}{\text{The number of possible results}}$$

Calculating Probabilities

If you can calculate probabilities, you can use this simple method:

The probability of rolling a 4 on a normal die = $\frac{1 \text{ side with the number } 4}{6 \text{ possible sides}}$

Calculating Probabilities

If you can calculate probabilities, you can use this simple method:

$$\begin{array}{l} \text{The probability of} \\ \text{rolling a 4 on a} \\ \text{normal die} \end{array} = \frac{1}{6}$$

Calculating Probabilities

Which of these statements are true about the word MATHEMATICAL?

- The probability of picking a vowel is 50 % because a letter picked is either a vowel or it isn't.

False, there are less vowels than consonants.

- The probability of picking a vowel is $\frac{5}{12}$ because there are 5 vowels out of 12 letters.

True

Ratio and proportion

RATIO compares part to part,

'two to every three' or 'two for every three'



What is the ratio of red to black

4 red to every 8 black

What is the ratio of black to red?

8 black to every 4 red

Ratio and proportion

RATIO compares part to part,

'two to every three' or 'two for every three'



What is the ratio of red to black?

one red to every two black

What is the ratio of black to red?

two black to every one red

Ratio and proportion

RATIO compares part to part,

'two to every three' or 'two for every three'



What is the ratio of red to black?

1 : 2

What is the ratio of black to red?

2 : 1

Ratio and proportion

PROPORTION compares a part to the whole,

'two in every five' (this is like a fraction)



What proportion of this shape is red?

What proportion of this shape is black?

Ratio and proportion

PROPORTION compares a part to the whole,

'two in every five' (this is like a fraction)



What proportion of this shape is red?

four reds out of twelve squares in total

What proportion of this shape is black?

eight blacks out of twelve squares in total

Ratio and proportion

PROPORTION compares a part to the whole,

'two in every five' (this is like a fraction)



What proportion of this shape is red?

four out of twelve

What proportion of this shape is black?

eight out of twelve

Ratio and proportion

PROPORTION compares a part to the whole,

'two in every five' (this is like a fraction)



What proportion of this shape is red?

four / twelve

What proportion of this shape is black?

eight / twelve

Ratio and proportion

PROPORTION compares a part to the whole,

'two in every five' (this is like a fraction)



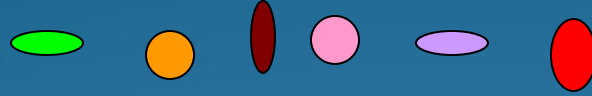
What proportion of this shape is red?

$4 / 12$

What proportion of this shape is black?

$8 / 12$

Smartie Party



- Count the number of smarties you have of each colour, and list them.
eg. Red 1

Green 3

- Find the total number of smarties and write it down.
- Write down the ratio of each colour, to every other colour.
eg. Red:Green
1:3

Work in a methodical way and don't miss any.

- Write down each colour as a proportion of the total.
eg. Green 3 in 15

Extension: Now try to write down each colour as a proportion of the total as a) a fraction eg. Green $\frac{3}{15}$ (or $\frac{1}{5}$)
b) a decimal eg. Green 0.2
c) a percentage eg. Green 20%

You may use a calculator to help you.

- Eat them!

Ratio and proportion

PROPORTION compares a part to the whole,

'two in every five' (this is like a fraction)



What proportion of this shape is red? $\frac{4}{12}$

What proportion of this shape is black? $\frac{8}{12}$

Ratio and proportion

PROPORTION compares a part to the whole,

'two in every five' (this is like a fraction)



What proportion of this shape is red? $\frac{4}{12} \equiv \frac{1}{3}$

What proportion of this shape is black? $\frac{8}{12} \equiv \frac{2}{3}$

These numbers are called

Proper fractions

$$\frac{1}{2}$$

$$\frac{3}{15}$$

$$\frac{2}{3}$$

$$\frac{12}{22}$$

$$\frac{5}{6}$$

$$\frac{4}{7}$$

These numbers are called

Improper fractions

$$\frac{4}{2}$$

$$\frac{25}{15}$$

$$\frac{9}{3}$$

$$\frac{30}{22}$$

$$\frac{7}{6}$$

$$\frac{10}{7}$$

Here are some

mixed numbers

$$2\frac{1}{3}$$

$$5\frac{4}{9}$$

$$3\frac{2}{5}$$

$$1\frac{6}{8}$$

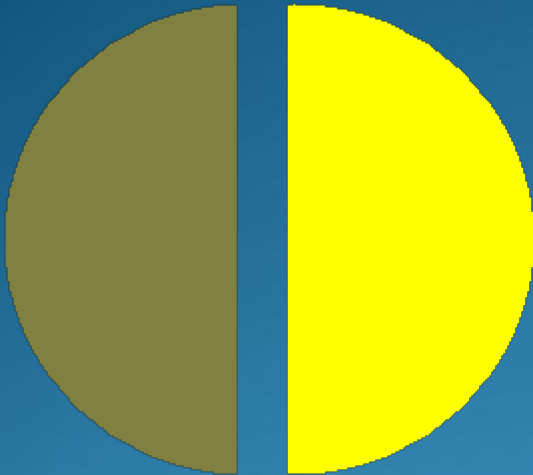
$$2\frac{1}{4}$$



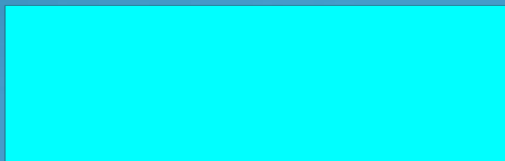
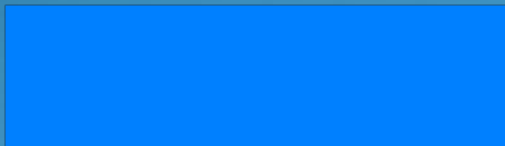
= **Whole chocolate bar**



Equivalent Fractions



Shown is one half



$$\frac{1}{2}$$

← NUMERATOR

← DENOMINATOR

Equivalent Fractions

We can use equivalent fraction to make our numbers easier to handle.

Smaller numbers are **SIMPLE**

Simplest form

Lowest terms

Simplified

Cancelled down

$$\begin{array}{ccc} \frac{160}{200} & \begin{array}{c} \div 10 \\ \equiv \\ \equiv \\ \equiv \end{array} & \frac{16}{20} & \begin{array}{c} \div 4 \\ \equiv \\ \equiv \\ \equiv \end{array} & \frac{4}{5} \end{array}$$