HARROW COLLEGE & UXBRIDGE COLLEGE (HCUC)

Mathematics

Functional Skills

Entry 3

Study Pack

Measure, Shape and Data Handling

HCUC

A merger between Uxbridge College and Harrow College

Harrow COLLEGE

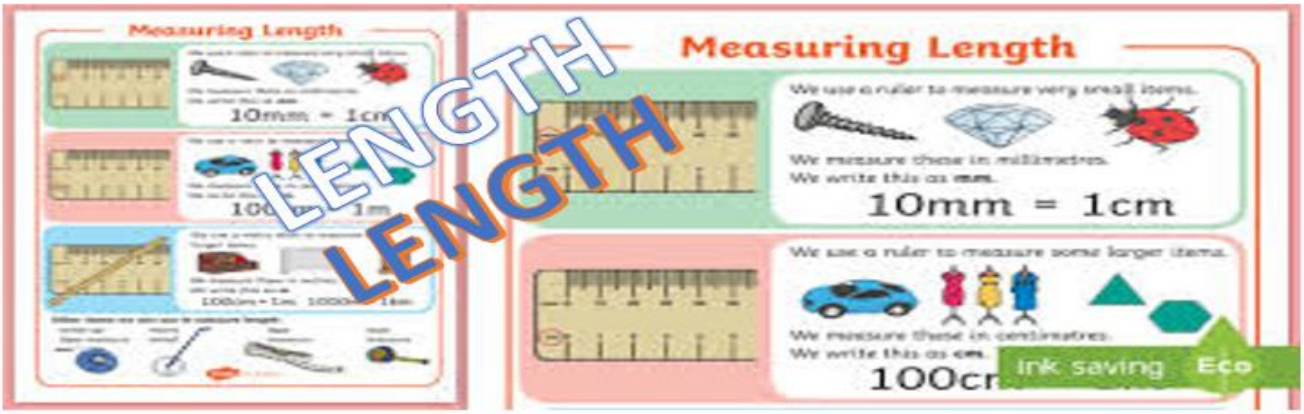
UXBRIDGE COLLEGE

HCUC offers courses in mathematics at Entry level, Level 1, GCSE and A level. The following resource gives you a taste of some of the topics covered in Functional Skills and GCSE maths lessons. It includes some important facts along with worked examples and exam style questions. The solutions are included for your reference.

The purpose of this resource is to give an initial insight into an example lesson. Actual lessons may consist of more activities/use of technology and may be adapted to meet the needs of individual learners.

In this pack there are three example lessons

CONVERSIONS



Contents: Conversions

Facts and Examples

In everyday life, such as when doing many household tasks, we need to measure length, weight and/or capacity (amount of liquid). For example, we need to measure ingredients for making cakes or pies.

Tim wants to bake a cake. He looks at a recipe which says that he needs 600 g of flour, 600 g of sugar and 500 ml of vegetable oil.	What are g and ml? 	g and ml are units of measure. 

Units of measure:

We do not always use ‘g’ or ‘ml’. There are other units as well.

Units that start with “kilo” are large. Units that start with “milli” are small. If we have to weigh something heavy like a bag of potatoes or to weigh ourselves we use kilograms (kg).

If we want to measure the thickness of a £1 coin, we use millimetres (mm).

Measuring length/width/height

- Length can be measured in millimetres (mm), centimetres (cm), meters (m) or kilometres (km).

Measuring weight

- Weight can be measured in grams (g) or kilograms (kg)

Measuring liquids such as water, coca – cola

- Capacity (amount of liquid) is measured in millilitres (ml) or litres (L).

Converting units:

Sometimes we may need to convert one unit to another. For example, if you need 300 ml of milk for one milkshake, how many one litre bottles of milk would you need to buy in order to make six milkshakes? To answer this question, you would need to convert litres to millilitres, or the other way round.

LENGTH:	WEIGHT:	CAPACITY:
1 km = 1000 m 1 m= 100 cm 1 cm=10 mm	1 kg =1000 g	1 L =1000 ml

EXAMPLES of conversions:

Example 1: Convert 6 L into ml.

1 L = 1000 ml

6 L = 6 x 1000 = 6000 ml

Example 2: Convert 5000 g into kg.

1 kg =1000 g

5000 g= 5000 ÷ 1000 = 5 kg

Example 3: Convert 3 m into cm.

1 m = 100 cm

3 m = 3 x100 = 300 cm

Exam Style Questions

Question 1:

Ryan wants to put a cupboard and a table in the living room.

The width of a space in the living room is 197 cm.

The width of the cupboard is 1 m.

The width of the table is 84 cm.

Will the cupboard and table fit in the space?

Question 2:

Siddique is making a wedding cake. He needs 2 kg of flour.

Each bag of flour weighs 500 g.

How many bags will he need to buy?

Question 3:

Lyn wants to buy cleaning liquid for her flat.

She can choose one large bottle or two small bottles.

The large bottle contains 1 litre and the small bottles contain 429 ml each.

Does one large bottle have more liquid than two small bottles?

You must show your working.

Questions taken from Edexcel Exam Papers

ANSWERS:

Question 1:

Total length of cupboard and table = 1 m + 84 cm *(1 m= 100 cm)*

= 100 cm + 84 cm

=184 cm

The width of the space = 197 cm

So, the cupboard and the table will fit in the space.

Question 2:

1 kg = 1000 g

So 2 kg= 2 x 1000 = 2000 g

One bag contains 500 g

Number of bags he needs to buy = 2000 ÷ 500 = 4.

Question 3:

The large bottle contains 1 litre. *(1 litre = 1000 ml)*

1 L = 1000 ml

Two small bottles contain 429 + 429

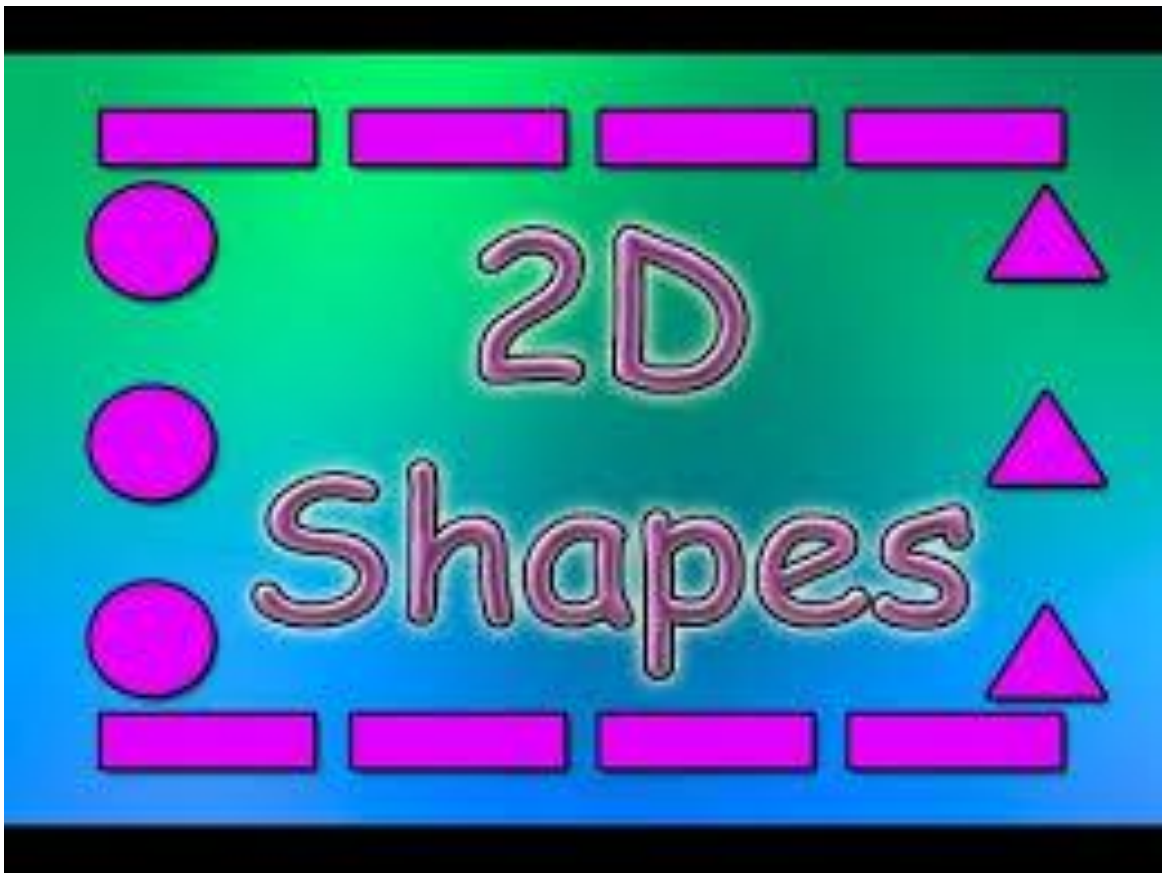
= 858 ml

Yes, one large bottle has more liquid than two small bottles.

USEFUL LINKS

For further information and more practice questions, check out the following links:

Useful links	Information
https://www.bbc.co.uk/bitesize/guides/zthsgk7/revision/3	Good revision material at all levels
Edexcel https://www.gatewayqualifications.org.uk/webinars/good-practice-in-assessing-entry-level-qualifications/	Past exam papers from Edexcel
Skills workshop: https://www.skillsworkshop.org/category/link-types/learning-resources-external-links/printable-resource-sites/printable-maths-numer	More practice and information on Measure



HCUC

A merger between Uxbridge College and Harrow College

Harrow COLLEGE

UXBRIDGE COLLEGE

Measure 2D Shapes and Angles

Entry 3

Study Resource

HCUC
A merger between Uxbridge College and Harrow College

Harrow COLLEGE

UXBRIDGE COLLEGE

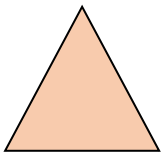
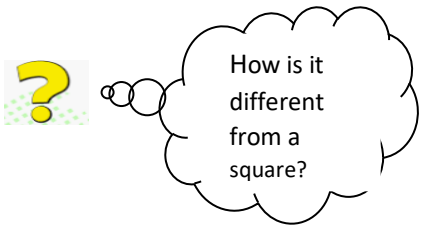
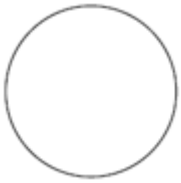
HCUC offers courses in mathematics at Entry level, Level 1, GCSE and A level. The following resource gives you a taste of some of the topics covered in Functional Skills and GCSE maths lessons. It includes some important facts along with worked examples and exam style questions. The solutions are included for your reference.

The purpose of this resource is to give an initial insight into an example lesson. Actual lessons may consist of more activities/use of technology and may be adapted to meet the needs of individual learners.

Contents 2D shapes and Angles

2D shapes:

Any **shape** that can be laid flat on a piece of paper or any mathematical plane is a **2D shape**. You can find **2D shapes** in the world all around you. Examples of **2D shapes** include rectangles, octagons, and even hearts. (2D full form is 2 Dimension)

Name of the Shape	Properties; What it is?	We see these shapes everyday……. Have you seen these?
Square: It is like a cheese slice 	It has 4 sides and 4 Right angles all sides are equal in length	
Triangle 	It has 3 sides	
Rectangle : is like a piece of paper or your phone The opposite sides are the same length 	Has 4 sides and 4 Right  angles.	
Pentagon: Like a superman logo 	It has 5 sides and 5 corners	
 Hexagon	Hexagon has 6 sides, 6 corners	
Circle: Like a CD 	It has no side, no corners.	

All images are taken from google.com

Example question; 2D shapes

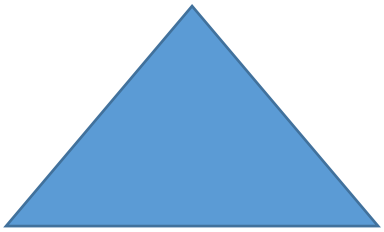
Question 1: What is the name of the following shape?

Answer

The name of the above shape is Rectangle

Question 2

a) What is the name of the following shape?



b) How many sides does this shape have?

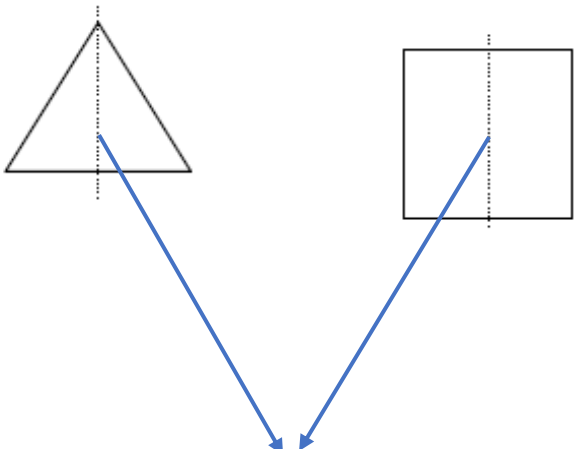
Answer 2

a) Triangle
b) Triangle has 3 sides

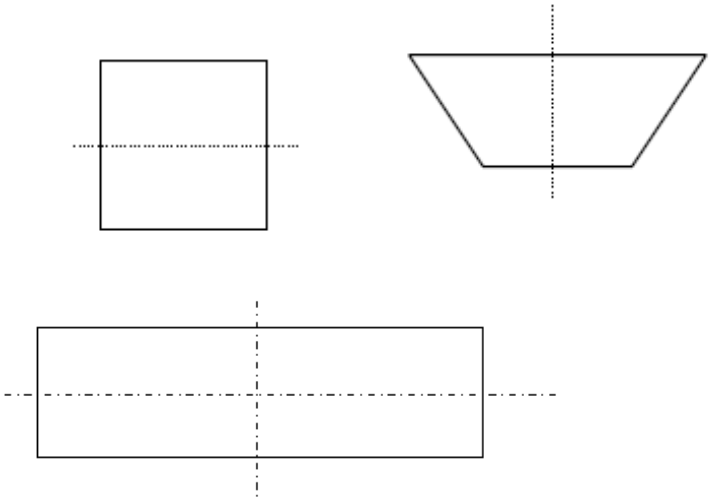
Symmetry and lines of symmetry

A shape which can be split into 2 equal parts is said to have a line of symmetry.
If a shape can be folded so that one half exactly fits on top of the other half, then it has a line of symmetry at the fold. In order to be able to do this, at least two opposite sides must be equal in length.
If a shape has a line of symmetry, it is **symmetrical**.

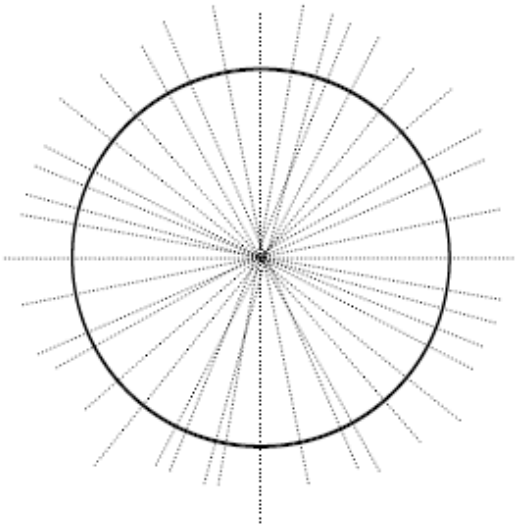
You can draw a line to split each shape into two equal parts.



Line of symmetry



The Rectangle has 2 lines of symmetry



Lots!!

A circle has thousands of lines of symmetry. More than we can imagine. We say that this is an **infinite** number.

All images are taken from google.com

Example question; line of symmetry

Question 1

What is the name of the following shape and how many lines of symmetry does it have?

Answer

The name of the above shape is Rectangle. I has 2 lines of symmetry.

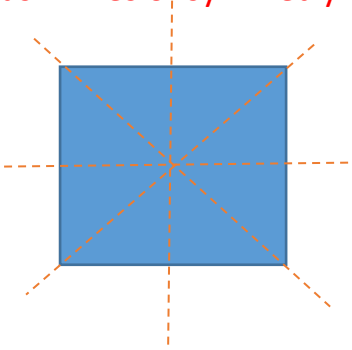
Question 2

a) What is the name of the following shape?

b) How many lines of symmetry does this shape have?

Answer 2

a) Square
b) Square has 4 lines of symmetry



All images are taken from google.com

Angles

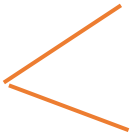
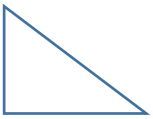
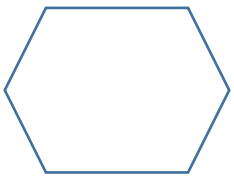
In simple words we can say that angles are formed when 2 lines meet at a point

Different types of angles

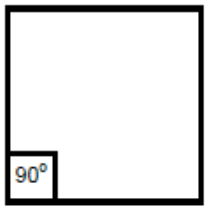
Angles can be of different types

Names of Angle

As the Angle Increases, the Name Changes:

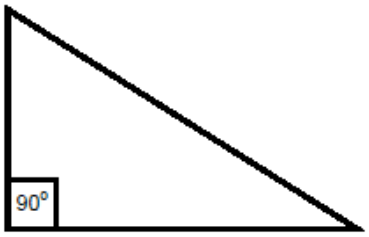
Type of Angle	Description
Acute Angle 	is less than 90°
Right Angle 	is 90° exactly
Obtuse Angle 	is greater than 90° but less than 180°

A right angle is an angle that measures 90°. Many shapes and objects have right angles.



Square

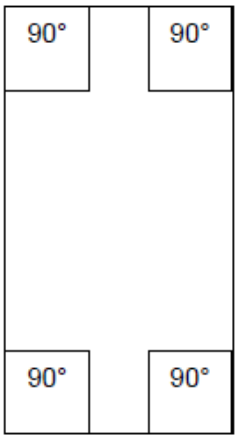
Rectangle

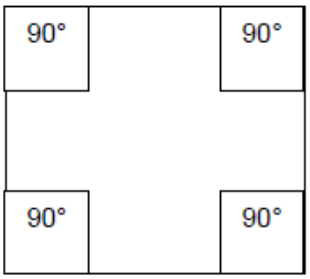


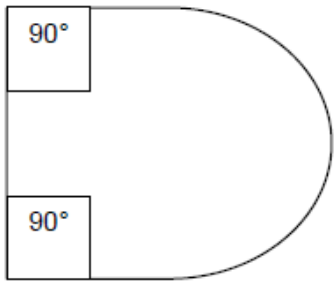
Right-angled triangle

In each of the shapes shown above, the angle marked is 90° and is called a right angle.

Examples

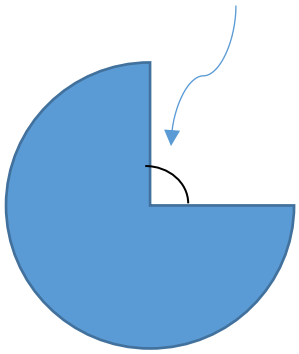






Example question; Angles

What angle is made here?



Answer ; Question Angle

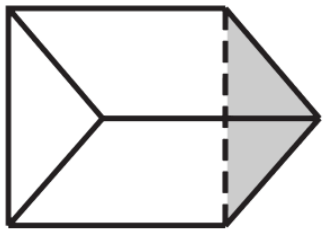
The angle is a right angle

All images are taken from google.com

Exam style questions

Question 1

Mo sells a chocolate bar with this shape



What is the name of the shape of the shaded end?

Edexcel exam E3 2015-2016 (1 mark)

Question 2

The life jackets are kept in this box.

The box is in the shape of a cuboid.

There is a label on each face of the box except the bottom face.

What is the name of the shape of the bottom face of the box?

Edexcel exam E3 2014-2015 (1 mark)

Question 3

Miss Jackson needs to put flowers in each corner of her garden.

a) What shape is her garden?

b) How many plants will she need?

(2marks)

All images are taken from google.com

Answers

Question 1: Triangle

Question 2: Rectangle

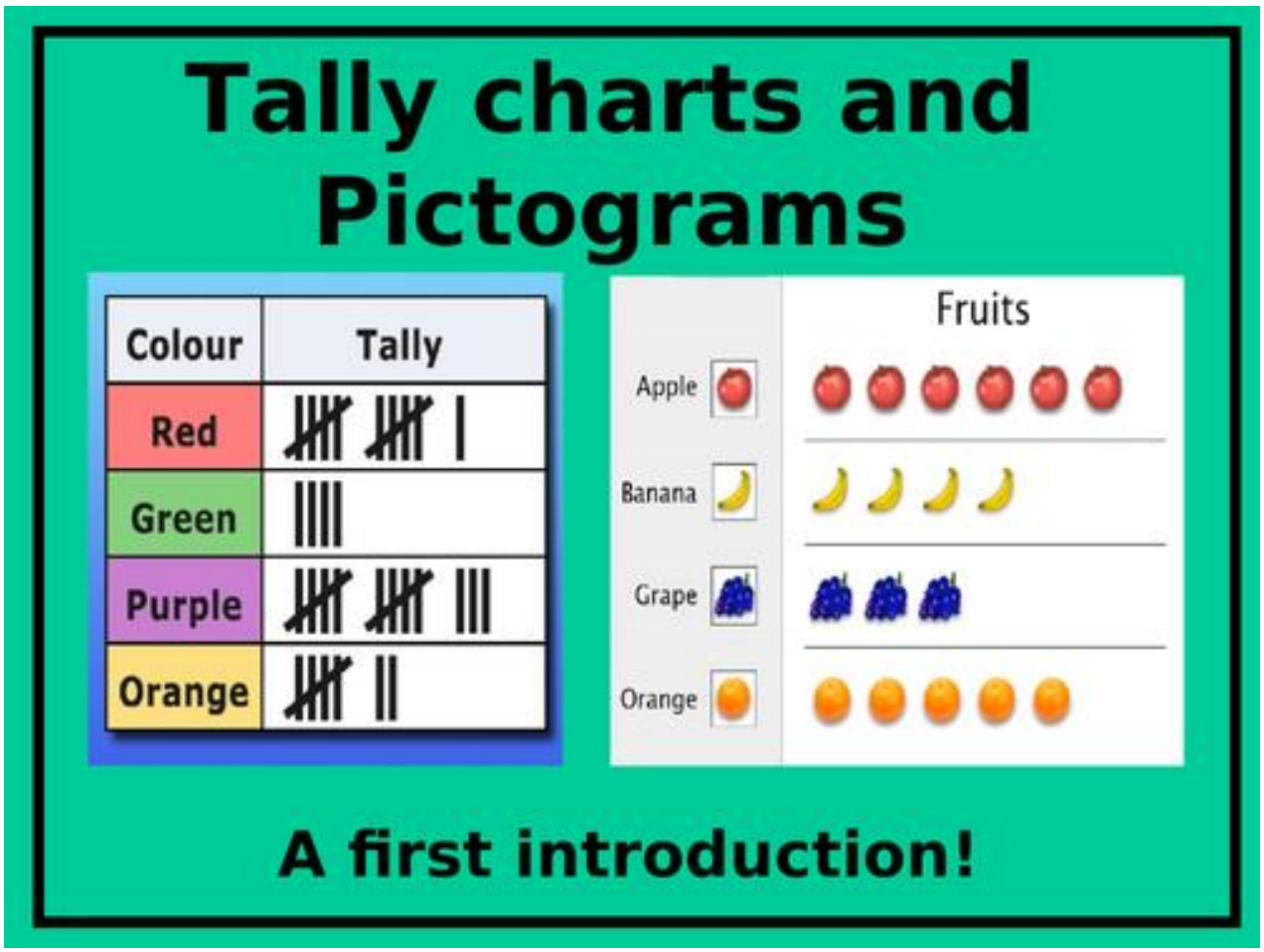
Question 3

a) *The shape of her garden is RECTANGLE*
b) *She will need 4 plants as the rectangle shape has 4 corners*

Useful links	What can you find ?
https://www.primaryresources.co.uk/maths/mathsE3.htm	More resources for practice questions
https://www.bbc.co.uk/bitesize/guides/zgbd2nb/revision/1	Facts about 2D shapes
https://www.mathsisfun.com/shape.html	Fun activities for you to practice

References:

1) https://www.bbc.co.uk/bitesize
2) https://www.splashlearn.com/math-vocabulary/geometry
3) https://www.bbc.co.uk/bitesize/subjects/z826n39
4) https://www.google.com/imghp?hl=en
5) https://study.com/
6) https://www.mathsisfun.com/angles.html



HCUC

A merger between Uxbridge College and Harrow College

Harrow COLLEGE

UXBRIDGE COLLEGE

Data Handling

Tally charts and Pictograms

Entry 3

Study Resource

HCUC
A merger between Uxbridge College and Harrow College
Harrow COLLEGE
UXBRIDGE COLLEGE

HCUC offers courses in mathematics at Entry level, Level 1, GCSE and A level. The following resource gives you a taste of some of the topics covered in Functional Skills and GCSE maths lessons. It includes some important facts along with worked examples and exam style questions. The solutions are included for your reference.

The purpose of this resource is to give an initial insight into an example lesson. Actual lessons may consist of more activities/use of technology and may be adapted to meet the needs of individual learners.

Content page Tally Charts and Pictograms

Tally charts and Pictogram in Functional Skills Entry 3

Tally charts and Pictogram are part of Data handling in Maths. Data handling skills help people organise and understand various kinds of collected information.

Key Words

Keyword	Description
Data	Facts and statistics collected together for reference and analysis
Tally	A continuous count of something
Frequency	The number of times a data value occurs
Table	Data arranged into rows and columns
Chart	A graphical representation of data
Pictogram	Representation of data through pictures
Bar chart	A chart that uses bars to represent data in different categories

Images have been taken from google: *https://www.google.com/search?*

Tally charts

A tally chart is a quick and easy way of recording data. It involves

- Filling in a chart with vertical dashes representing each time a piece of information is observed.
- The data is immediately divided into categories or groups ready to understand (analysed).

Here is an example tally chart which is investigating the favourite colours of students in Entry classes.

- ❖ Every line in the tally column represents one learner who liked the specific colour.

Example: 4 learners and 5 learners are represented like below

|||| =4 𝍸 =5

Easy to see and understand information

COLOUR	TALLY	TOTAL
Red	𝍸 𝍸 |||	13
Orange	|||	3
Pink	𝍸 ||	7
Blue	𝍸 𝍸 𝍸 ||	17
Purple	𝍸 ||	7
Yellow	𝍸 𝍸 𝍸 ||	17
Green	𝍸 𝍸 𝍸	15
Other	|||	3

Information gathered in Tally charts can be converted into pictograms, bar charts, pie charts and etc so that the information can be read and understood easily.

Images have been taken from google: *https://www.google.com/search?*

Pictograms

A **pictogram** is a chart that uses pictures to represent data. They use columns of pictures to show the number involved.

Let's use the below tally chart which shows the favourite pets for some learners in a group

ANIMAL	TALLY	TOTAL
CAT	𝍸 |	6
DOG	𝍸 𝍸 |	11
RABBIT	𝍸 |||	8

ANIMAL	NUMBER OF CHILDREN WHO CHOSE IT
CAT	
DOG	
RABBIT	

Easy to see and understand information

1 picture = 1 Cat

1 picture = 1 Dog

1 picture = 1 Rabbit

Images have been taken from google: *https://www.google.com/search?*

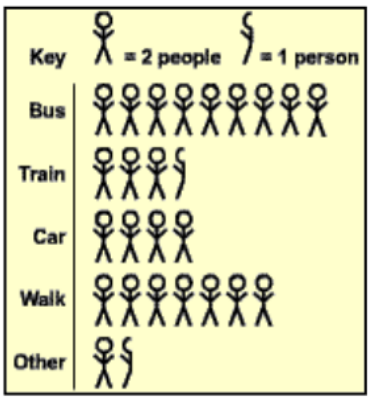
Example question on Pictogram

50 children were asked which method of transport they used to travel to school. The results are given below:

Bus 18 Train 7 Car 8 Walk 14 Other 3

Represent this data in the form of a pictogram.

The Answer



Remember a pictogram should always have a ***key***. In this example the ***key*** shows that each stickperson represents 2 people.

Source: http://www.bbc.co.uk/schools/gcsebitesize/maths/datahandlingfi/representingdatarev3.shtml

- *A pictogram should have a key*
- *Number of children in the picture is given by the key*

Images have been taken from google: *https://www.google.com/search?*

Exam Question on Tally chart

Question 1

Elsa records the colours of the cars in the school car park. Here is the list of the colours of the 20 cars.

White	White	Black	White	Red
Black	Red	Blue	White	Blue
Black	Blue	Black	Blue	Black
Black	Black	Blue	White	Blue

(a) Complete the table to show this information.

	Tally	Frequency
Black		
Blue		
Red		
White		

(2)

Question 2

The incomplete table show information about the number of ice creams sold by a shop last week.

	Tally	Frequency
Monday	𝍸 |	6
Tuesday	𝍸 ||||	
Wednesday	𝍸 𝍸	
Thursday	𝍸 ||	
Friday		11

(a) Complete the tally chart. (2)

Images have been taken from google: *https://www.google.com/search?*

Solutions

Question 1

Elsa records the colours of the cars in the school car park. Here is the list of the colours of the 20 cars.

White	White	Black	White	Red
Black	Red	Blue	White	Blue
Black	Blue	Black	Blue	Black
Black	Black	Blue	White	Blue

(a) Complete the table to show this information.

	Tally	Frequency
Black	𝍸 II	7
Blue	𝍸 I	6
Red	II	2
White	𝍸	5

(2)

Question 2

The incomplete table show information about the number of ice creams sold by a shop last week.

	Tally	Frequency
Monday	𝍸 I	6
Tuesday	𝍸 IIII	9
Wednesday	𝍸 𝍸	10
Thursday	𝍸 II	7
Friday	𝍸 𝍸 I	11

(a) Complete the tally chart. (2)

Images have been taken from google: *https://www.google.com/search?*

Pictogram Exam style questions

Staff at a leisure centre recorded the number of drinks sold from a drinks machine over one week. The results have been displayed using a pictogram.

Day	Drinks Sold	Total
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		
	Key  = 10 drinks	

1a. Work out the total drinks sold for each day.
Write your answers in the spaces above.

1b. On which day were the least drinks sold?

Solution

Q1a

Staff at a leisure centre recorded the number of drinks sold from a drinks machine over one week. The results have been displayed using a pictogram.

Day	Drinks Sold	Total
Monday		50
Tuesday		30
Wednesday		60
Thursday		30
Friday		50
Saturday		80
Sunday		70
	Key  = 10 drinks	

Q1b) Tuesday and Thursday

Images have been taken from google: *https://www.google.com/search?*

Question 2 - Car Survey

The students at an engineering and design college conducted a survey to see which colours were the most popular for cars. They have displayed their results in a pictogram. Look at the pictogram carefully and then answer the questions.

Car Colour	Number of Cars	Total
Red		80
White		
Blue		35
Green		
Yellow		
Silver		
Black		85
Key	 = 10 cars	

2a. Complete the missing totals for White, Green, Yellow and Silver.

2b. Draw in the missing pictograms for Black

2c. Calculate the total number of cars seen by the students during their survey

Images have been taken from google: *https://www.google.com/search?*

Solution Question 2

Car Colour	Number of Cars	Total
Red		80
White		50
Blue		35
Green		20
Yellow		20
Silver		145
Black		85
Key	 = 10 cars	425

Question 2 - Car Survey

The students at an engineering and design college conducted a survey to see which colours were the most popular for cars. They have displayed their results in a pictogram. Look at the pictogram carefully and then answer the questions.

2a. Complete the missing totals for White, Green, Yellow and Silver. See pictogram

2b. Draw in the missing pictograms for Black. See pictogram

2c. Calculate the total number of cars seen by the students during their survey. 425

Useful websites

Link	Explanation
https://www.bbc.co.uk/bitesize/guides/zvybkqt/revision/1 https://www.bbc.co.uk/bitesize/guides/zrg4jxs/revision/4	**BBC** Bitesize will help with your homework, revision and learning. Find free videos, step-by-step guides, activities and quizzes by level and subject.
https://www.skillsworkshop.org/resources/entry-2-number-practice-test	The site has a powerful faceted search function: try typing something into the "Search" box at the top right of every page and then filter by author and type (resource or external link). You can see our 500+ resource contributors and follow the links to their information pages to see lists of all the resources they've contributed
https://www.mathsgenie.co.uk/papers.html	Very useful website where you can revise different topics using videos and exam style question
http://corbettmaths.com	Very useful website where you can revise different topics using videos and exam style question

Images have been taken from google: *https://www.google.com/search?*

CONTACT US:

UXBRIDGE COLLEGE

Uxbridge Campus

Park Road,
Uxbridge,
Middlesex
UB8 1NQ

Hayes Campus

College Way,
Coldharbour Lane,
Hayes,
Middlesex
UB3 3BB

T +44 (0)1895 853333
www.uxbridgecollege.ac.uk

HARROW COLLEGE

Harrow-on-the-Hill Campus

Lowlands Road,
Harrow,
Middlesex
HA1 3AQ

Harrow Weald Campus

Brookshill,
Harrow Weald,
Middlesex
HA3 6RR

T +44 (0) 020 8909 6000
www.harrow.ac.uk

HCUC

A merger between Uxbridge College and Harrow College

Harrow COLLEGE

UXBRIDGE COLLEGE