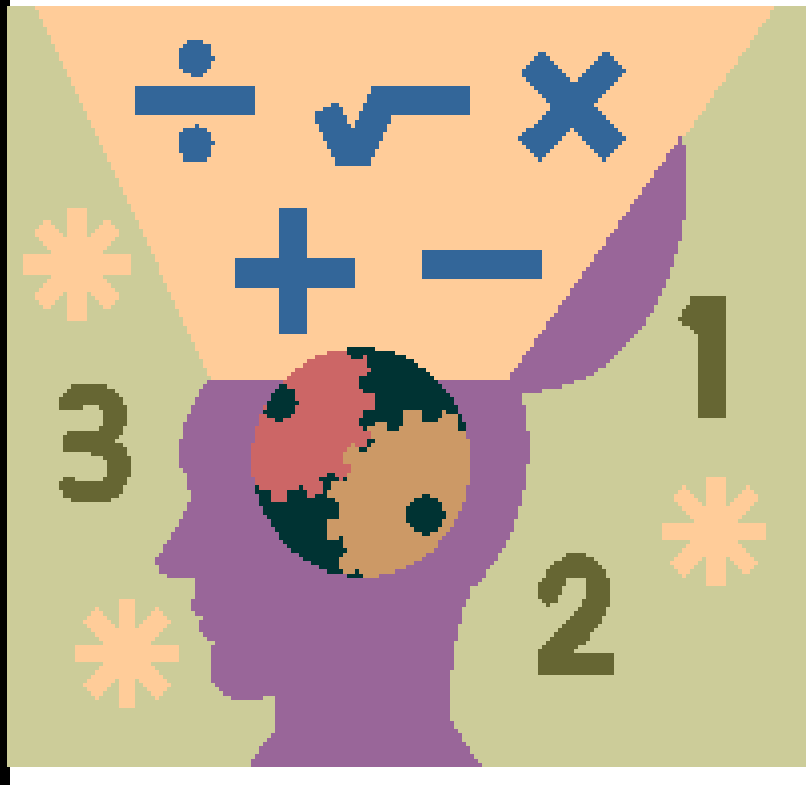
MATHEMATICS

Block 4

2nd Level



Measurement

Length

We use rulers, metre sticks trundle wheels etc to measure length. Length can be measure in a variety of different units:

Millimetre (mm)– used for measuring small lengths e.g. length of finger nail

Centimetre (cm) – also used for measuring small lengths e.g. length of jotter

Metre (m) – used for measuring longer lengths e.g. length of the room

Kilometre (km) – used for measuring longer lengths e.g. distance between Larkhall and Glasgow

It is useful to be able to change from one unit of measure to another:

10 mm = 1cm

100 cm = 1 m

Exercise 1: Conversion of units

To change from cm to mm we **multiply by 10** because there are 10 mm in 1 cm:

1	1cm = **10** mm	**2**	2cm = ____mm	**3**	3cm = ___mm
4	6cm = ____mm	**5**	10cm = ____mm	**6**	9cm = ___mm
7	11cm = ____mm	**8**	20cm = ____mm	**9**	3cm = ___mm
10	1.5cm = ____mm	**11**	2.7cm = ____mm	**12**	3.9cm = ___mm

To change from mm to cm we **divide by 10** because there are 10 mm in 1 cm:

13	10mm = **1** cm	**14**	20mm = ____cm	**15**	35mm = ___cm
16	60mm = **____**cm	**17**	100mm = ____cm	**18**	93mm = ___cm
19	12mm = ____cm	**20**	27mm = ____cm	**21**	30mm = ___cm
22	85mm = ____cm	**23**	57mm = ____cm	**24**	39mm = ___cm

To change from cm to m we **divide by 100** because there are 100 cm in 1m:

25	100cm = **1** m	**26**	200cm = ____m	**27**	350cm = ___m
28	600cm = **____**m	**29**	750cm = ____m	**30**	930cm = ___m
31	120cm = ____m	**32**	260cm = ____m	**33**	390cm = ___m
34	850cm = ____m	**35**	530cm = ____m	**36**	398cm = ___m

To change from m to cm we **multiply by 100** because there are 100 cm in 1m:

37	1m = **100 c**m	**38**	2m = ____cm	**39**	3m = ___cm
40	6m = **____**cm	**41**	10m = ____cm	**42**	30m = ___cm
43	60m = ____cm	**44**	25m = ____cm	**45**	33m = ___cm
46	85m = ____cm	**47**	53m = ____cm	**48**	62m = ___cm

Exercise 2: Measuring Length

You will need a ruler and a metre stick

1 In your jotter measure and draw lines which are

a 6cm **b** 9cm **c** 7.5cm **d** 10.5cm

e 62mm **f** 95m **g** 75mm **h** 120mm

2 Measure (in cm):

a Your thumb = _____ cm **b** Width of your jotter = ____ cm

c Your pencil/pen = _____ cm **d** Width of your foot = ____ cm

e Length of your foot = _____ cm **f** Width of your desk = ___ cm

3 Measure (in m):

a Your Height = ____ m **b** Height of the door = ____ m

c Width of the room = ____ m **d** Length of the room = ____ m

e Height of the room = ____ m **f** Width of the window = _____m

4 If you have time make a list of different objects in the class and first of all estimate then measure the length of each noting your answers in your jotter.

Weight

We use scales to measure weight. There are different types of scales, in home economics you use kitchen scales to weigh ingredients. at home you use bathroom scales to weigh yourself. Weight can be measured using a variety of different units:

Grams (g) – used for measuring small items e.g. ingredients for baking

Kilograms (kg) –used for measuring heavier items e.g. yourself

Tonne (T) – used for measuring much heavier items e.g. a lorry

It is useful to be able to change from one unit of measure to another:

1000g = 1kg

Exercise 3: Conversion of units

To change from kg to g we **multiply by 1000** because there are 1000 g in 1 kg:

1	1kg = **1000** g	**2**	2kg = ____g	**3**	3kg = ___g
4	6kg = ____g	**5**	10kg = ____g	**6**	9kg = ___g
7	11kg = ____g	**8**	20kg = ____g	**9**	3kg = ___g
10	1.5kg = ____g	**11**	2.7kg = ____g	**12**	3.9kg = ___g

To change from g to kg we **divide by 1000** because there are 1000 g in 1 kg:

13	1000g = **1** kg	**14**	2500g = ____kg	**15**	3500g = ___kg
16	6000g = ____kg	**17**	1500g = ____kg	**18**	9300g = ___kg
19	1200g = ____kg	**20**	2700g = ____kg	**21**	3000g = ___kg
22	8500g = ____kg	**23**	5700g = ____kg	**24**	3900g = ___kg

Exercise 4: Measuring Weight

You will need a set of kitchen scales and bathroom scales

1 Measure (in g)

a Your jotter = _____ g

b A textbook = ____ g

c Your pencil/pen = _____ g

d Your shoe = ____ g

e 2lt bottle = _____ g

f A calculator = ___ g

2 Measure (kg):

a Your Weight = ____ kg

b Your schoolbag = ____ kg

3 If you have time make a list of different objects in the class and first of all estimate then measure the weight of each noting your answers in your jotter.

Volume/Capacity

We use liquids poured into a measuring jug or beaker to measure the volume of liquids. Liquids like water can be used to measure the space inside an object. Volume can be measured using a variety of different units:

Millilitre (ml) – used for measuring small items e.g. liquid in a cup/glass

Litre (L) –used for measuring larger items e.g. petrol in a car

It is useful to be able to change from one unit of measure to another:

1000ml = 1L

Exercise 3: Conversion of units

To change from L to ml we **multiply by 1000** because there are 1000 ml in 1 L:

1	1L = **1000** ml	**2**	2L = ____ml	**3**	3L = ___ml
4	6L = ____ml	**5**	15L = ____ml	**6**	7L = ___ml
7	12L = ____ml	**8**	20L = ____ml	**9**	3L = ___ml
10	1.5L = ____ml	**11**	2.6L = ____ml	**12**	6.8L = ___ml

To change from g to kg we **divide by 1000** because there are 1000 g in 1 kg:

13	1000ml = **1** L	**14**	3500ml = ____L	**15**	500ml = ___L
16	6500ml = ____L	**17**	1500ml = ____L	**18**	6300ml = ___L
19	2200ml = ____L	**20**	2750ml = ____L	**21**	3100ml = ___L
22	9600ml = ____L	**23**	5900ml = ____L	**24**	3950ml = ___L

Exercise 4: Measuring Volume

You will need some water and a measuring jug/beaker

1 Your teacher will give you a variety of different objects to measure. First of all estimate then measure the volume of each noting your answers in your jotter.

Object	Estimate	Actual

ORDER OF OPERATIONS

When there is more than 1 calculation to be done, the operations **MUST** be done in the following order:

1st **Brackets**

2nd **Multiplication and division**

3rd **Addition and subtraction**

Calculate

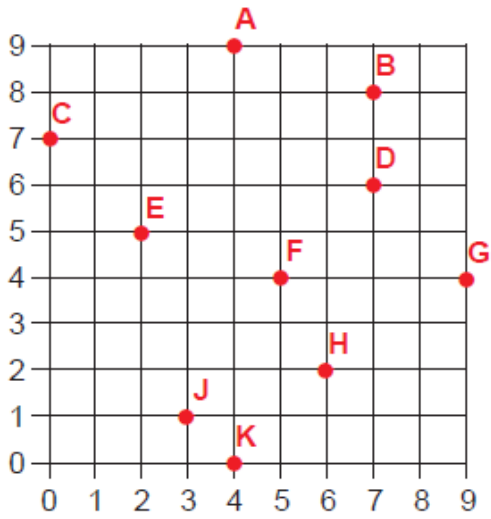
1	3 **x** 5 + 4	**2**	3 + 5 **x** 4	**3**	2 + 7 **x** 3
4	15 **x** 2 - 3	**5**	4 + 3 **x** 2	**6**	3 **x** 4 + 8
7	12 ÷ 6 + 4	**8**	3 + 8 ÷ 4	**9**	25 ÷ 5 + 10
10	10 - 10 ÷ 5	**11**	20 ÷ 5 + 6	**12**	100 ÷ (40 ÷ 8)
13	4 + 5 **x** 6	**14**	8 **x** 3 + 4	**15**	10 ÷ 5 x 2
16	9 **x** 8 + 4	**17**	2 × 15 ÷ 6	**18**	100 ÷ 20 + 4
19	100 ÷ (5 **x** 4)	**20**	100 ÷ (5 **–** 4)	**21**	8 x (6 **+** 4)
22	100 ÷ (5 x 4)	**23**	20 – (8 + 3)	**24**	(2 + 28) ÷ 6
25	(100 **–** 80) ÷ 5	**26**	4 x (6 **+** 1)	**27**	(4 **+** 6) x 7

28	4 **x** 5 + 1	**29**	13 + 5 **x** 4	**30**	3 + 8 **x** 3
31	20 **x** 2 - 3	**32**	40 + 3 **x** 2	**33**	3 **x** 4 + 18
34	24 ÷ 6 + 1	**35**	2 + 16 ÷ 4	**36**	25 ÷ 5 + 10
37	10 - 10 ÷ 5	**38**	20 ÷ 4 + 6	**39**	100 ÷ (40 ÷ 8)
40	2 + 6 **x** 6	**41**	9 **x** 4 + 3	**42**	15 ÷ 5 x 2
43	9 **x** 7 + 10	**44**	2 × 15 ÷ 6	**45**	100 ÷ 2 + 4
46	80 ÷ (4 **x** 5)	**47**	100 ÷ (6 **–** 4)	**48**	6 x (7 **+** 3)
49	60 ÷ (5 x 4)	**50**	21 – (9 + 2)		

Coordinates

Exercise 1:

1



Write in the coordinates of the points marked -

A is (,) **B** is (,) **C** is (,)

D is (,) **E** is (,) **F** is (,)

G is (,) **H** is (,) **J** is (,)

K is (,)

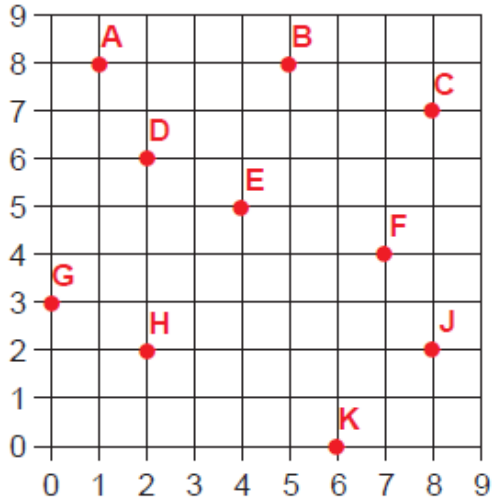
Mark in these points and their letters -

P at (2, 7) **Q** at (9, 7) **R** at (3, 6) **S** at (5, 6)

T at (3, 3) **V** at (7, 3) **W** at (0, 2) **X** at (9, 2)

Y at (1, 1) **Z** at (8, 0)

2



Write in the coordinates of the points marked -

A is (,) **B** is (,) **C** is (,)

D is (,) **E** is (,) **F** is (,)

G is (,) **H** is (,) **J** is (,)

K is (,)

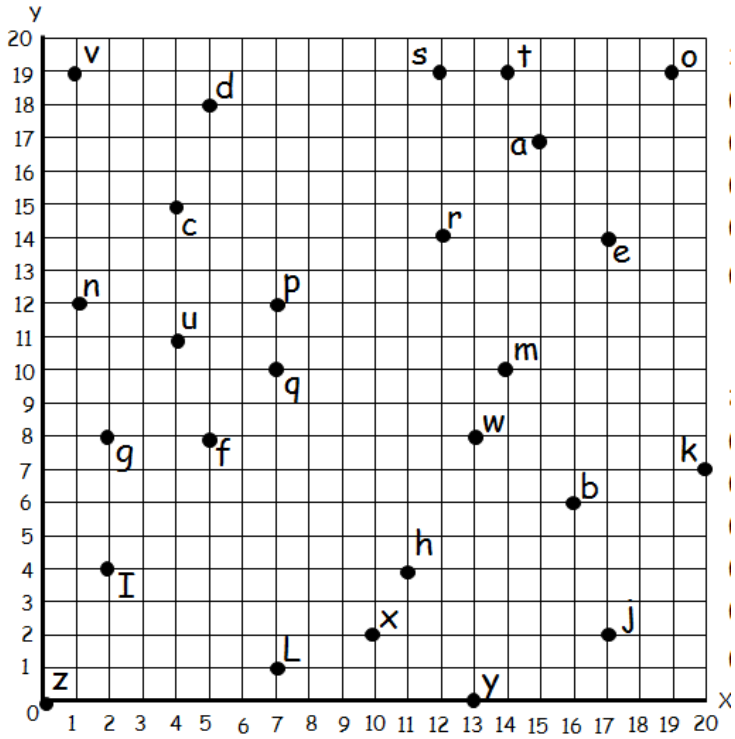
Mark in these points and their letters -

P at (8, 9) **Q** at (3, 8) **R** at (3, 7) **S** at (6, 6)

T at (0, 5) **V** at (9, 5) **W** at (2, 4) **X** at (4, 3)

Y at (4, 1) **Z** at (2, 0)

3



Use the coordinates to find out the artist and song hidden in the grid

(14, 10) (2, 4) (4, 15) (11, 4) (15, 17) (17, 14) (7, 1)

(17, 2) (15, 17) (4, 15) (20, 7) (12, 19) (19, 19) (1, 12)

(17, 14) (15, 17) (12, 14) (14, 19) (11, 4)

(12, 19) (19, 19)(1, 12) (2,8)

4

Label the *x*-axis from 0 to 10 and the *y*-axis from 0 to 10

Plot each point, joining them up as you plot them using a ruler.

A. Join (0, 6) to (2, 6) to (2, 8) to (0, 8) to (0, 6)

B. Join (5, 5) to (4, 7) to (5, 8) to (6, 7) to (5, 5)

C. Join (7, 5) to (8, 5) to (8, 8) to (7, 8) to (7, 5)

D. Join (0, 5) to (1, 4) to (4, 5) to (3, 6) to (0, 5)

E. Join (0, 2) to (1, 3) to (0, 4) to (3, 3) to (0, 2)

F. Join (3, 4) to (5, 2) to (6, 5) to (5, 3) to (3, 4)

G. Join (7, 0) to (6, 2) to (7, 4) to (8, 2) to (7, 0)

H. Join (1, 0) to (2, 2) to (4, 2) to (5, 0) to (1, 0)

Write the name of each quadrilateral inside it.

Exercise 2:

Plot the following points on x and y axes numbered from 0 to 10.
Join the points in the order they are given and you should see a picture.

A. (1,2), (0,4), (2,4), (2,5), (3,5), (3,6), (4,6), (4,5), (5,5), (5,6), (6,6), (6,5), (7,5), (7,4), (10,4), (8,2), (1,2)

B. (5,1), (5,3), (0,5), (0,6), (5,4), (5,5), (10,5), (10,1), (5,1)

C. (2,0), (3,1), (4,1), (4,4), (2,4), (3,8), (6,8), (7,4), (5,4), (5,1), (6,1), (7,0), (2,0)

D. (1,4), (0,4), (0,7), (1,7), (1,6), (7,6), (7,7), (10,7), (10,4), (7,4), (7,5), (1,5), (1,4)

E. (1,2), (1,4), (0,4),(0,5),(7,5), (8,7), (9,7), (10,5), (10,5), (10,4), (9,2), (8,2), (7,4), (3,4), (3,2),(1,2)

F. (5,8), (8,6), (10,6), (10,5), (8,5), (5,3), (10,3), (10,2), (5,2), (8,0), (6,0), (3,2), (1,2), (1,3), (3,3), (6,5), (1,5), (1,6), (6,6), (3,8), (5,8)

Exercise 3:

MICKEY MOUSE

Plot on diagram 32x38

A. (8,19), (6,17), (4,17), (3,18), (1,21), (1,25), (3,28), (6,30), (8,30), (10,29), (11,27), (11,24), (10,22), (8,19)

B (17,25), (15,26), (14,28), (14,31), (17,34),(19,35), (22,35), (25,34), (26,32), (26,29), (25,27), (22,25), (17,25)

C (19,12), (17,15), (18,19), (19,20), (21,18), (21,12), (19,12)

D (23,13), (22,16), (22,20), (23,21), (25, 19), (25,14), (23,13)

E (29,8), (27,9), (27,10), (29,12), (32,12), (32,10), (29,8)

F (19,4), (15,4), (13,5), (8,8), (7,11), (7,16), (8,19)

G (10,22), (13,24), (15,25), (17,25)

H (22,25), (24,24), (27,21), (28,17), (28, 16), (27,13)

I (17,21), (18,22)

J (20,9), (22,11), (24,12), (27,13), (29,13), (31,12)

K (25,21), (24,22)

L (32,10), (30,7), (27,4), (24,3), (22,3), (19,4), (16,5), (15,6), (14,9)

M (8,0), (15,4)

N (23,0), (22,3)

O (11,8), (14,9), (15,8)

P (8,8), (8,11), (10,13), (12,14), (14,13), (15,11), (14,17), (14,19), (18,23), (20,23), (21,21), (22,23), (24,23), (26,22)

Q (21,16), (20,15), (19,16), (19,18), (20,19)

R (25,17), (24,16), (23,17), (23,19), (24,20)

BART SIMPSON

Plot on Diagram 32x38

Step 1 – The Outline of my Face.

Plot these coordinates in order and then join the dots. Plot the coordinates from left to right.

(10,6)	(10,12)	(8,13)	(7,15)	(7,17)	(8,18)
(0,42)	(4,40)	(4,44)	(7,42)	(7,45)	(10,44)

(10,47)	(13,45)	(13,48)	(16,46)	(17,49)	(19,46)
(20,49)	(22,46)	(23,50)	(24,46)	(30,34)	(30,32)
(32,24)	(33,21)	(35,18)	(35,16)	(34,14)	(32,13)
(23,12)	(26,12)	(24,9)	(25,7)	(24,6)	(22,5)
(22,3)	(20,2)	(18,2)	(16,2)	(14,3)	(12,4)

Step 2 – My Mouth.

(26,12)	(22,12)	(18,13)	(16,13)	(14,12)	(14,10)
(16,8)	(20,6)	(24,7)	(22,10)	(24,12)	

Step 3 – My Tongue.

(20,6)	(20,8)	(22,9)	(20,11)	(19,10)	(18,11)
(17,11)	(16,10)	(16,8)			

Step 4 – My Nose.

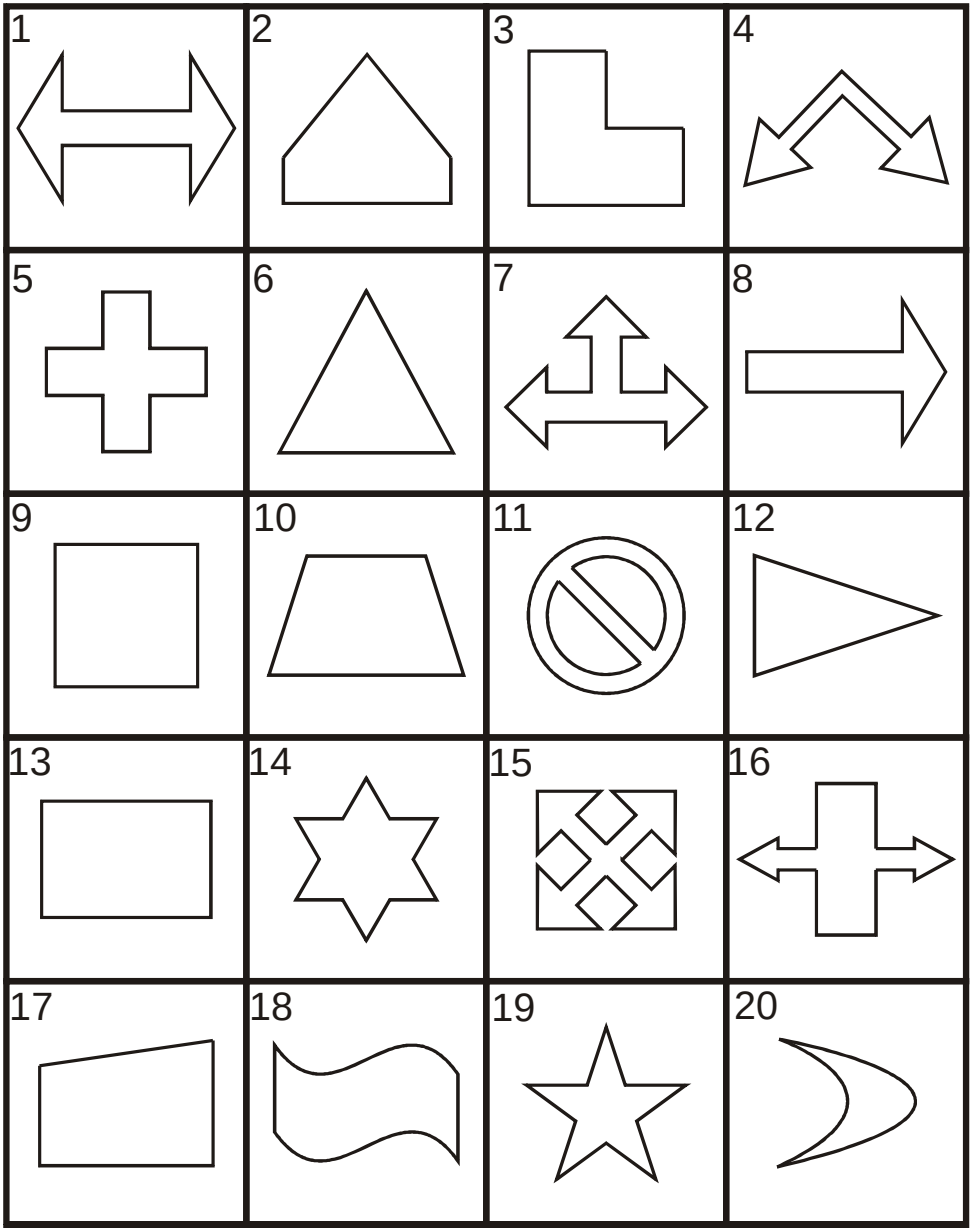
(29,22)	(30,21)	(31,20)	(31,19)	(31,17)	(30,16)
(28,16)	(26,17)	(25,19)			

Step 5 – My Eyes.

Draw 2 circles centred at the points (19,24) and (28,28).

Symmetry

Exercise 1: Lines of Symmetry



Exercise2: Lines of Reflection

Ask your teacher for Reflection Worksheet A