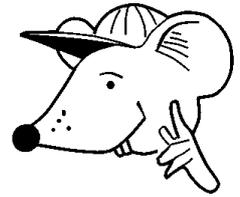




MATHEMATICS



N.S. Yr. 5 P.103

**Describe and visualise 3-D and 2-D shapes
and classify them according to their properties.**

Equipment

Paper, pencil, ruler, tracing paper

MathSphere

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Concepts

Children should be able to use, read and write the following words:

pattern, shape, 2-D, two-dimensional, 3-D, three dimensional, line, side, edge, face, surface, base, point, angle, vertex, vertices, centre, radius, diameter, net, make, build, construct, draw, sketch, curved, straight, regular, irregular, concave, convex, closed, open, circular, triangular, hexagonal, cylindrical, spherical, square-based, right-angled, congruent.

They should be able to name, classify and describe the following 2-D and 3-D shapes:

circle, semi-circle, triangle, equilateral triangle, isosceles triangle, scalene triangle, quadrilateral, rectangle, oblong, square, pentagon, hexagon, heptagon, octagon, polygon, cube, cuboid, pyramid, sphere, hemisphere, cylinder, cone, prism, tetrahedron, octahedron, polyhedron.

Most of these words are included in the MathSphere Dictionary.

It is essential that children understand all the work in the preceding module before attempting this one. Use of the correct vocabulary cannot be over-emphasised and this should be practised and applied correctly at every stage.

Children should understand the meaning of the word 'congruent'. We use this word when two or more shapes are identical in every way including size.

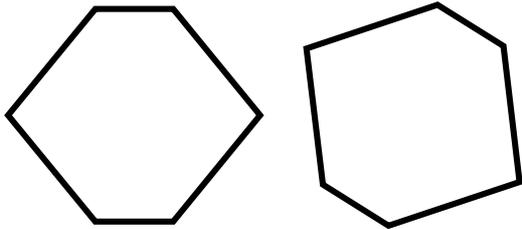
Classifying shapes continues, but with more sophistication. Children should now be able to classify 3-D shapes according to the number of faces, edges and vertices, the shape of each face, whether or not any face is right-angled, and whether or not the number of edges meeting at each vertex is the same or different .

They should be able to classify 2-D shapes according to the number of right angles, whether opposite sides are equal and parallel and whether the diagonals bisect one another (cut each other in half, as in a right angle).

They should also be familiar with the properties of many shapes such as equilateral and scalene triangles.



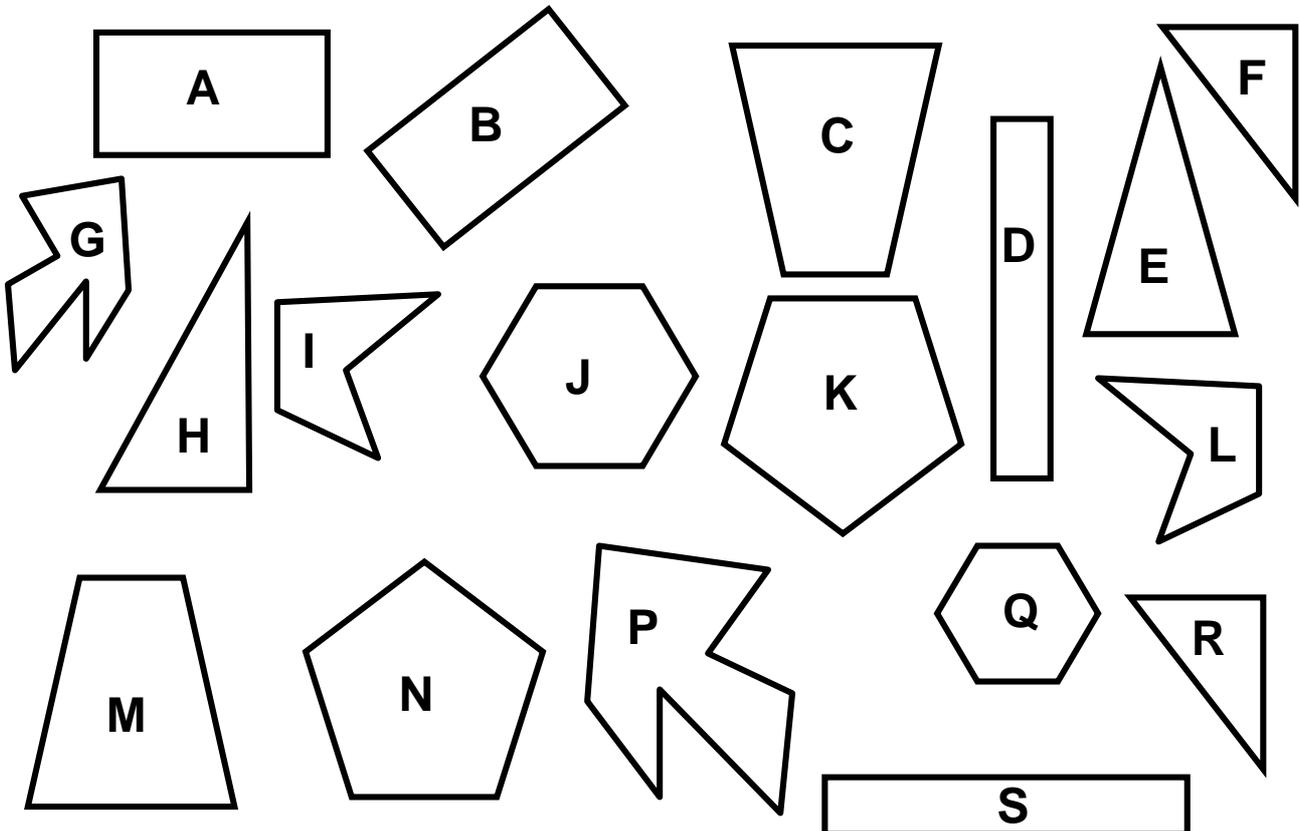
Do you know about congruent shapes?
Congruent shapes are shapes that have exactly the same length of sides and the same angles.



These two shapes are **congruent**, even though one is turned round a little. They have the same length sides and the same angles.



Find **pairs** of shapes that are congruent in this group:
(You might find tracing paper helpful.)



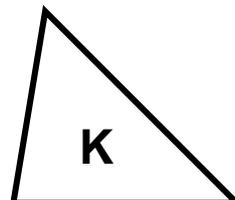
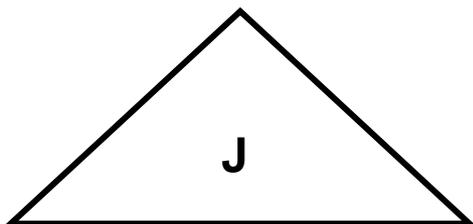
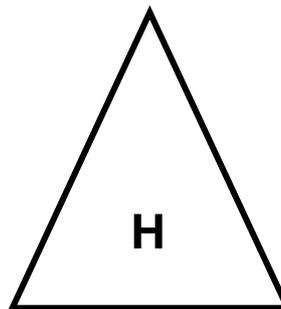
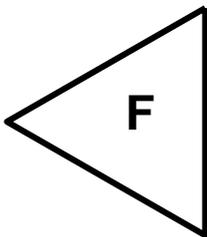
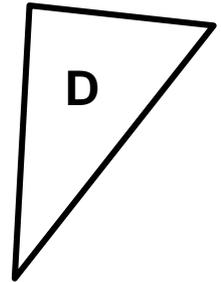
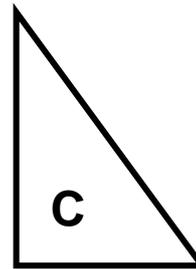
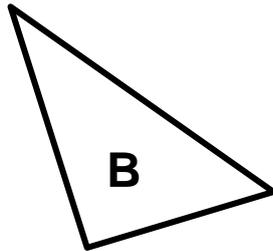
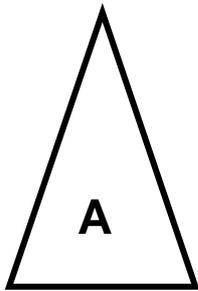
A **scalene** triangle is one which has no sides the same length and no equal angles.

How do you know that, Subby?

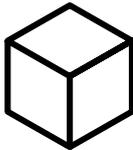
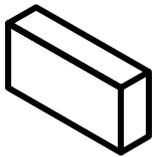
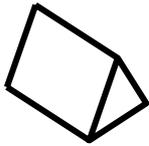
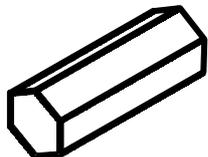
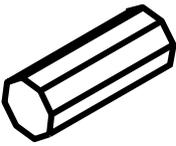
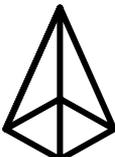
I'm a genius!



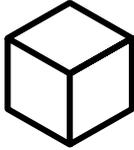
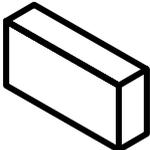
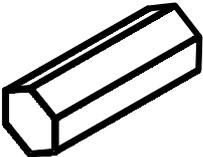
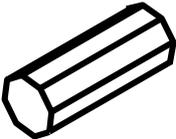
Which of these triangles are **scalene** triangles? You may need to measure some of the sides.



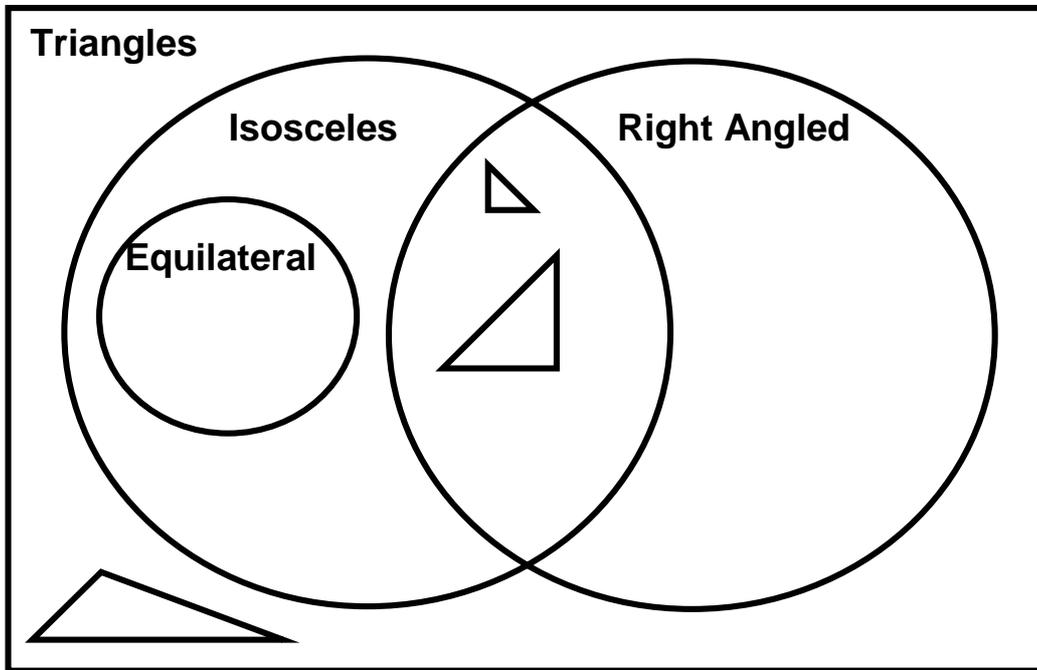
Look carefully at some 3-D shapes and fill in the spaces in the table below:

Shape Name	Shape Picture	Number of triangular faces	Number of rectangular faces (including squares)	Number of hexagonal faces	Number of octagonal faces
Cube		0	6	0	0
Cuboid					
Triangular prism					
Hexagonal prism					
Octagonal prism					
Square based pyramid					
Tetrahedron					
Octahedron					

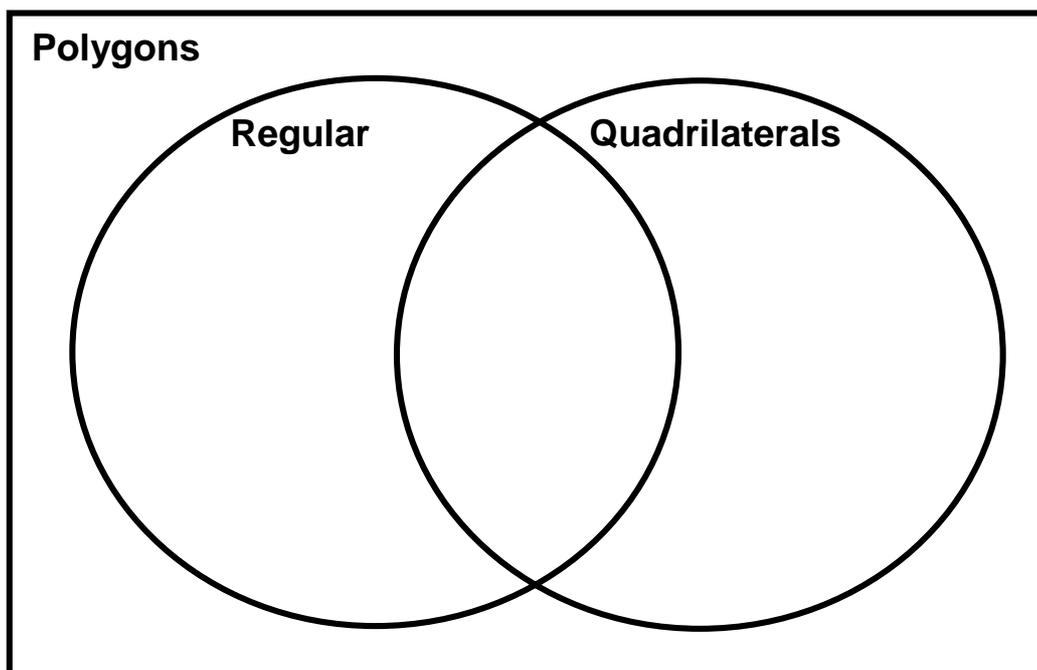
Look carefully at some 3-D shapes and fill in the spaces in the table below:

Shape Name	Shape Picture	Number of faces	Number of edges	Number of vertices	Number of right angles on all the faces
		6	12	8	24
					
Triangular prism					
					
					
Square based pyramid					
					
					

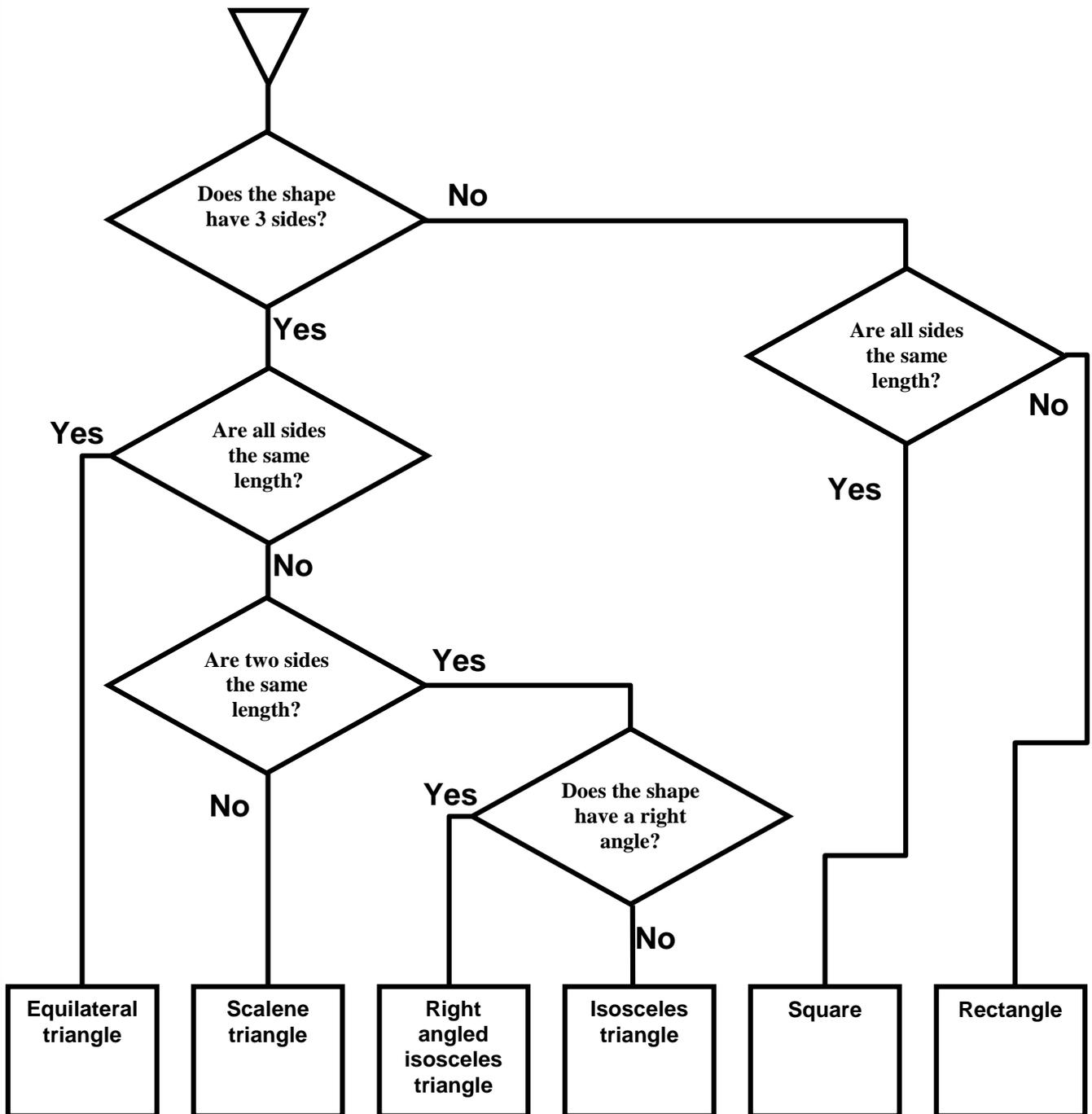
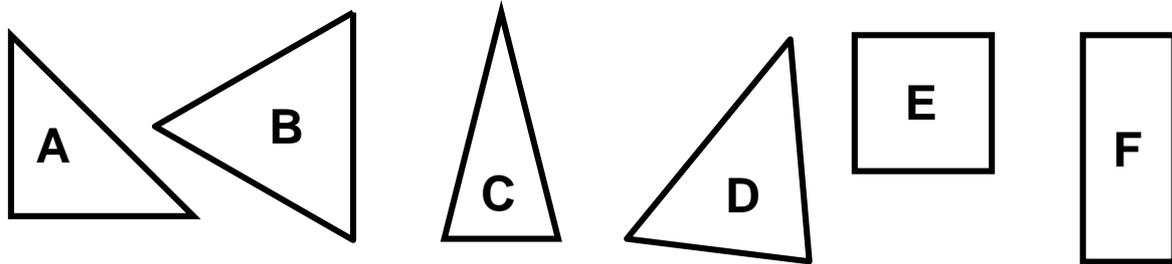
a) Draw some triangles in the different areas of this Venn Diagram. Some have been done for you. *(If it helps, you could photocopy or draw this page larger.)*



b) Draw some shapes in the different areas of this Venn Diagram.



Use this flow chart ('binary tree') to identify these shapes, one at a time.





And lastly, a shape wordsearch.
Yippee!!!!!!!!!!

Find these words:

quadrilateral, pentagon, square, cylinder,
sphere, circle, hemisphere, parallelogram,
hexagon, octagon, triangle, prism, cube,
pyramid, cuboid, cone, pentagonal,
tetrahedron, semicircle.

D	I	M	A	R	Y	P	E	P	L	F	H	P
T	R	I	A	N	G	L	E	E	R	M	E	C
S	C	F	Q	S	C	P	Q	N	G	P	X	Y
Q	U	A	D	R	I	L	A	T	E	R	A	L
U	B	R	I	T	V	R	I	A	B	I	G	I
A	E	C	U	B	O	I	D	G	C	S	O	N
R	G	N	O	G	A	T	C	O	K	M	N	D
E	R	E	H	P	S	O	N	N	V	C	D	E
N	O	G	A	T	N	E	P	A	L	X	P	R
M	A	R	G	O	L	E	L	L	A	R	A	P
E	Z	E	R	E	H	P	S	I	M	E	H	U
W	H	L	E	L	C	R	I	C	I	M	E	S
N	O	R	D	E	H	A	R	T	E	T	Y	A

Answers

Page 3 A and B C and M I and L K and N D and S F and R	Page 4 B, C, D, E, G and K
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Page 5

Shape Name	Shape Picture	Number of triangular faces	Number of rectangular faces (including squares)	Number of hexagonal faces	Number of octagonal faces
Cube		0	6	0	0
Cuboid		0	6	0	0
Triangular prism		2	3	0	0
Hexagonal prism		0	6	2	0
Octagonal prism		0	8	0	2
Square based pyramid		4	1	0	0
Tetrahedron		4	0	0	0
Octahedron		8	0	0	0

Page 6

Shape Name	Shape Picture	Number of faces	Number of edges	Number of vertices	Number of right angles
Cube		6	12	8	24
Cuboid		6	12	8	24
Triangular prism		5	9	6	12
Hexagonal prism		8	18	12	24
Octagonal prism		10	24	16	32
Square based pyramid		5	8	5	4
Tetrahedron		4	6	4	0
Octahedron		8	12	6	0

Answers

Page 8

A is a **right angled isosceles triangle**

B is an **equilateral triangle**

C is an **isosceles triangle**

D is a **scalene triangle**

E is a **square**

F is a **rectangle**

Page 9

D	I	M	A	R	Y	P	E	P	I	f	H	p
T	R	I	A	N	G	L	E	E	r	m	E	C
S	C	f	q	s	C	p	q	N	g	P	X	Y
Q	U	a	d	R	i	l	a	T	e	R	A	L
U	B	r	l	t	v	r	i	A	b	l	G	l
A	E	C	U	B	O	I	D	G	c	S	O	N
R	g	N	O	G	A	T	C	O	k	M	N	D
E	R	E	H	P	S	o	N	N	v	c	d	E
N	O	G	A	T	N	E	P	A	I	x	p	R
M	A	R	G	O	L	E	L	L	A	R	A	P
e	z	E	R	E	H	P	S	I	M	E	H	u
w	h	l	E	L	C	R	I	C	I	M	E	S
N	O	R	D	E	H	A	R	T	E	T	y	a

Capital letters are the answers.