### Test 1

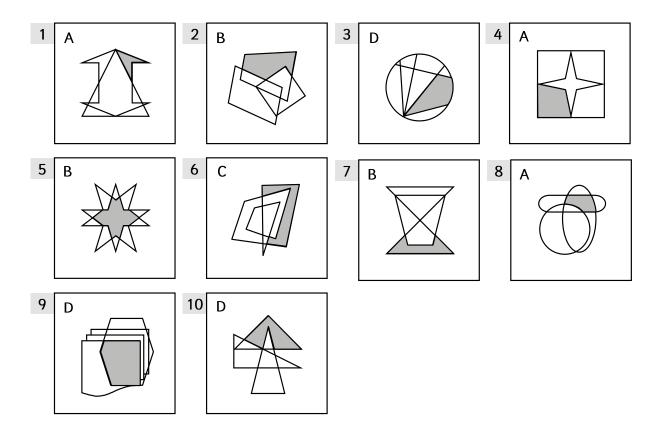
#### **Odd one out** p.5

1	D	In all the other pictures, the triangle is in the background.
2	D	In all the other pictures, the number of shapes within the outside shape is equal to the number of sides of the outside shape.
3	С	In all the other pictures, the arrows point inwards.
4	E	In all the other pictures, the shading in the smaller pentagons follows the anticlockwise sequence of light grey, white, striped, black and dark grey.
5	В	In all the other pictures, the arrow is pointing to a shape containing one more side than the preceding shape.
6	Α	In all the other pictures, when rotated, the small lines point in the opposite direction.
7	В	In all the other pictures, the triangles on the left point upwards and the triangles on the right point downwards.
8	Е	In all the other pictures, the number of lines is equal to half the number of sides in the shapes.
9	В	All pictures have the same number of stars as they have thick lines outside the square, except for B.

### Grids p.7

1	D	The shapes have been reflected and, from left to right, the objects in the foreground are changed to the background.
2	D	From left to right, the shape on the right is rotated by 90 degrees clockwise, shaded black and placed in the background.
3	Α	From left to right, the shape and shading is rotated by 45 degrees clockwise.
4	D	From top to bottom, the outer shape becomes the middle shape, the inner shape becomes the outer shape, and the middle shape becomes the inner shape.
5	С	From top to bottom, the entire picture is rotated 90 degrees clockwise.
6	С	From left to right, the pictures are reflected.
7	Е	From left to right, the shapes in the inner shape and outside the inner shape are transposed.
8	В	From left to right, the pictures are reflected.

#### Hidden shapes p.9



### Families p.11

1	А	The number of lines on the outside of the shape is equal to one fewer than there are numbers of sides of the shape itself.
2	С	Each picture consists of three shapes. One with horizontal lines, one with vertical lines and one white shape.
3	E	When rotated, the pictures have one dot bottom left, two dots bottom right and three diagonal dots top right.
4	E	Each picture contains three lines with an arrow at one end, pointing in the same direction, and two lines with two arrows.
5	D	When rotated, both pictures have a white, grey and black circle from left to right on top. On the bottom, the pattern is grey circle on the left, black circle on the right.
6	В	The shapes are concave. All the options are convex except for B.
7	F	Each picture contains three ellipses, three squares and three right-angled triangles; each shape has three different outlines.

#### Test 2

### Views p.13

1	В	Six cubes can be seen from the top down.
2	D	Four cubes can be seen on the left, three in the next column and one in the third column.
3	Α	Four cubes on each side can be seen from the top down, forming a quadrangle shape.
4	А	Four cubes can be seen in the first column and four cubes can be seen in the top row. Two cubes can be seen in the second column.
5	С	Three cubes can be seen in each column and row, forming a square shape.
6	В	Three cubes can be seen in the first row. Two cubes can be seen in the second column. Four cubes can be seen in the third column and one cube can be seen in the fourth column.
7	С	Four cubes can be seen in the first row and four can be seen in the first column. Three cubes can be seen in the third column and four cubes can be seen in the fourth column.
8	С	Two cubes can be seen in the first column and two cubes can be seen in the first row. Two cubes can be seen in the third column.
9	D	Four cubes can be seen in the first row and four cubes can be seen in the first column. Three cubes can be seen in the third row and four cubes can be seen in the fourth row.

#### Rotations p.15

1	А	Eliminate B as the stripes are in the wrong orientation. Eliminate C as the striped section is wrongly positioned within the triangle. Eliminate D as the striped section is too large.
2	D	Eliminate A as the lightning bolts do not all point towards the centre of the picture. Eliminate B and C as the dark grey lightning bolt needs to be positioned to the right of the black lightning bolt.
3	В	Eliminate A and C as the arrows are not in the correct position. Eliminate D as one of the arrows has the incorrect end.
4	В	Eliminate A as the circles do not have alternating dotted and solid lines. Eliminate C as the diameter is not solid. Eliminate D as the circles are dashed, not dotted.
5	Α	Eliminate B, C and D as the lines do not follow the sequence of thickest to thinnest from the shaded end of the rectangle.
6	С	Eliminate A as there is an extra line in the white section. Eliminate B as the shading is incorrect and D as the 'flag' is flipped horizontally.
7	В	Eliminate A and C as the star and the sun are positioned incorrectly. Eliminate D as the moons are all the same shape.

8	D	Eliminate A as the shapes have been flipped horizontally. Eliminate B as there is no white shading in the centre. Eliminate C as there are two white sections adjacent to each other.
9	С	Eliminate A as there are only three pentagons. Eliminate B as the circle has two lines. Eliminate D as the triangles are not positioned correctly.
10	А	Eliminate B as the shading in the stars does not follow the sequence of grey, black, spotted and white. Eliminate C and D as the spotted star should overlap the stars on either side.

#### Sequences p.17

1	F	The stars are moving clockwise within the picture. The crescent is rotating 90 degrees clockwise and the shading alternates between black and white.
2	А	The circles are alternating in shading and position. The chevron lines are increasing by one with each picture, and the triangle is alternating in shading and position with each picture.
3	В	The square with the vertical stripes is moving one space anticlockwise and the square with the horizontal stripes is also moving one space anticlockwise. The number of squares with a dotted line increases by one with each picture.
4	F	Each horizontal black marking moves up one with each picture.
5	С	The numbers of sides of the shapes in each picture follow the pattern: 2 & 8, 3 & 7, 4 & 6, 5 & 5, 6 & 4. The shape on the left has a gradually increasing number of sides, and the shape on the right has a gradually decreasing number.
6	А	The larger shapes increase by one more side in each picture and alternate between white and grey.  The small circle alternates between black and white and moves clockwise round the larger shape.
7	F	The small squares are alternating black and white and increasing by one with each picture. There are six shapes facing the same direction on the right and the orientation changes with each picture. The number of black shapes on the right decreases by one each time.

### Cubes p.19

1	В	Eliminate A as the diamond and the circle touch. Eliminate C as the cross and hexagon touch. Eliminate D as the square and triangle touch.
2	D	Eliminate A and C as the two stars touch. Eliminate B as the 16-point star and 24-point star touch.
3	D	Eliminate A as the dark grey and black circles touch. Eliminate B and C as the white and light grey circles touch.
4	С	Eliminate A as the arrows are in an incorrect orientation. Eliminate B and D as the chevron and callout touch.
5	А	Eliminate B as the star and the quadrilateral touch. Eliminate C as the irregular pentagon and the arrow touch. Eliminate D as the irregular nonagon and irregular hexagon touch.
6	С	Eliminate A as I and III touch. Eliminate B as IV and V touch. Eliminate D as the letters are in the wrong position and orientation.
7	А	Eliminate B as the shape with one grey square and the shape with four grey squares touch. Eliminate C as the shapes with three grey squares and four grey squares are in an incorrect orientation.  Eliminate D as the shapes with one grey square and five grey squares are in an incorrect orientation.
8	В	Eliminate A as the 'no entry sign' and ellipse touch. Eliminate C as the 'doughnut' and circle touch. Eliminate D as the arc and ellipse have incorrect orientation.
9	D	Eliminate A as the arrow and stripes touch. Eliminate B as the dark grey and moon touch. Eliminate C as the pentagon and light grey touch.
10	В	Eliminate A as the dotted triangle has incorrect orientation. Eliminate C as 2 the triangle shape and small triangle touch. Eliminate D as the 2 triangle shapes have the incorrect orientation.

# Test 3 Odd one out p.21

1	С	In all the other pictures, the two shapes are identical and rotated. C is reflected instead.
2	Е	In all the other pictures, the shape with the dots is in the foreground.
3	В	In all the other pictures, there is a central black shape and two black tiers.
4	D	In all the other pictures, the small white circle is in the foreground.
5	А	In all the other pictures, the number of sides in the shapes on the left and the right add up to the same.
6	D	In all the other pictures, there are four black squares and eight white squares.
7	В	In all the other pictures, the bottom layer of cubes follows the same stepped pattern. Seen from above, they would all look the same.
8	Е	All the other pictures are identical and rotated.
9	В	B is the only picture where the shapes all point in a clockwise direction.

### Reflections p.23

1	В	Eliminate A as the shapes on the left are directly on top of each other. Eliminate C as both shapes at the top are pointing outwards. Eliminate D as the shapes in the centre are both pointing in the same direction.
2	D	Eliminate A, B and C as the horseshoe shape should appear upright in the top right of the picture.
3	D	Eliminate A as the pentagon with vertical stripes will appear (inverted) in the top right of the picture. Eliminate B as the diagonal lines in both pentagons are in the wrong orientation. Eliminate C as the pentagon in the top right is not inverted.
4	Α	Eliminate B as the arrows are in the wrong position. Eliminate C as the arrow on the right is in the wrong position. Eliminate D as the arrow at the top has not been reflected.
5	В	Eliminate A as the two triangles joined together are incorrect. Eliminate C as the picture has been rotated. Eliminate D as the shading has been reversed.
6	С	Eliminate A as the ends of the third arrow down are incorrect. Eliminate B as the bottom arrow does not have two ends. Eliminate D as the fifth arrow down is pointing in the wrong direction.
7	А	Eliminate B because of the single circle at the top of the picture. Eliminate C as there are too few circles. Eliminate D as the picture is rotated.

8	D	Eliminate A as the picture is rotated. Eliminate B as there are too few cylinders. Eliminate C as the second and third columns from the left are the wrong way round.
9	А	Eliminate C as the pentagon should on the top right of the picture. Eliminate D as the square should be in the foreground. Eliminate B as the stripes in the parallelogram should be horizontal.
10	С	Eliminate A as there is only one dashed line. Eliminate B as the centre dashed lines are pointing in the same direction. Eliminate D as the smallest pentagon has a dashed outline.

### Families p.25

1	В	Both pictures contain three pairs of the same shapes and all with different shading.
2	E	Both pictures contain three identical shapes; the large shape has a dashed outline, the medium shape has a dotted outline and the small shape has a solid outline.
3	F	Both pictures contain the same number of shapes as the number of sides in the shapes.
4	D	Both pictures contain three identical shapes with the middle shape shaded dark grey.
5	А	The arrows in both pictures are pointing in an anticlockwise direction.
6	С	Both pictures have one quarter shaded.
7	D	Both pictures contain shapes that are reflected and have the shadings reversed.

### Analogies p.27

1	С	The outside shading moves to the inside of the picture and vice versa.
2	F	The picture is reflected horizontally, and the shadings reversed.
3	А	The whole picture is rotated 90 degrees anticlockwise, and the shading on the shape previously on the top becomes the shading of the larger shape.
4	D	The black circles remain unchanged and the grey and white circles change places with each other.
5	Е	The shapes on the opposite sides have been reflected vertically.
6	В	The lines in the cross are swapped and the ends of the arrows are changed to the opposite direction.
7	А	The shading of the middle shape becomes the shading of the stars and vice versa. The lines change from coming out of the sides to coming out of the corners.

#### Test 4

### Views p.29

1	А	Three cubes can be seen horizontally and vertically, forming a cross shape.
2	С	Four cubes can be seen on the top row, four in the first column, three in the second column, and two in the third column.
3	В	One cube can be seen in the first, second and third rows.
4	В	Two cubes can be seen in the first column, three in the second and third columns, and two in the fourth column.
5	D	Three cubes can be seen in rows one and two and in columns one and four.
6	А	Four cubes can be seen in the first row, and four cubes in columns one and four.
7	В	Three cubes can be seen in rows one and two, and three cubes in columns one and two.
8	С	Four cubes can be seen in row one, and four cubes in columns two and three.

#### Rotations p.31

1	С	Eliminate A as the end of the arrow is the incorrect style. Eliminate B and D as the colours in the shapes in the circles are incorrect.
2	С	Eliminate A as the shapes attached to the longer solid line are inverted. Eliminate B as the shortest line is dashed, not solid. Eliminate D as the dotted and dashed lines are reversed.
3	Α	Eliminate B as the shortest line should connect two black arrows. Eliminate C as the picture is a reflection about the vertical axis. Eliminate D as the connectors between the black arrows are incorrect.
4	D	Eliminate A as the diagonally striped squares are not adjacent to each other. Eliminate B and C as the diagonal stripes should be on the top and bottom.
5	А	Eliminate B as when rotated, the pentagon would be inverted. Eliminate C as the hexagon has been rotated by 90 degrees. Eliminate D as the octagon is white and the pentagon is dark grey.
6	В	Eliminate A, C and D as the sequencing of the arrows is incorrect.
7	С	Eliminate A as in there is no light grey rectangle in the middle of the top or bottom bars. Eliminate B and D as the pictures are reflections.
8	А	Eliminate B as the 'Z's are back to front. Eliminate C as the 'Z's are placed next to the convex part of the curved line. Eliminate D as there are three curved lines.
9	D	Eliminate A as the shading is incorrect. Eliminate B as the central star is white. Eliminate C as the central star has been rotated.
10	В	Eliminate A as the picture is a reflection. Eliminate C as the dotted line is in the incorrect position. Eliminate D as there is no bold line.

#### Cubes p.33

1	D	Eliminate A as the dotted line and circle touch. Eliminate B as the cross and chevron touch. Eliminate C as the flag and grey square touch.
2	С	Eliminate A as the star and plaque touch. Eliminate B as the arrow and pentagon touch. Eliminate D as the star and plaque touch.
3	А	Eliminate B as the diamond and the heart touch. Eliminate C as the grey square and the cross touch. Eliminate D as the pentagon and the arrow touch.
4	В	Eliminate A the dark grey arrow is in the wrong orientation. Eliminate C as the dark grey arrow has incorrect orientation. Eliminate D as the arrows are not in the correct position.
5	D	Eliminate A and C as the triangle and diamond touch. Eliminate B as the trapezium and the pentagon touch.
6	С	Eliminate A as the white and light grey faces touch. Eliminate B as the dark grey and grey spotty faces touch. Eliminate D as the dark grey face is in the wrong position.
7	А	Eliminate B as the thin double ring and the thickest ring touch. Eliminate C as the thick rings touch. Eliminate D as the thin double ring and thickest rings touch.
8	D	Eliminate A and C as the white triangle and small grey triangle touch. Eliminate B as the two pentagons touch.
9	В	Eliminate A and D as the thick lines and cross touch. Eliminate C as the dotted circle and arrow touch.
10	С	Eliminate A as the black star and pure grey star touch. Eliminate B as the dotted star and dashed star touch. Eliminate D as the outlined grey star is in the wrong position.

### Reflections p.35

1	А	Eliminate B as the shape is rotated. Eliminate C as the stripes in the triangle should be vertical. Eliminate D as the triangle should be in the foreground.
2	D	Eliminate A, B and C as the lightest grey star should be at the top.
3	В	Eliminate A as the picture is rotated. Eliminate C as the moon has been reflected horizontally. Eliminate D as the connecting line is pointing towards the small circle.
4	В	Eliminate A as the picture is rotated. Eliminate C as there are three grey hexagons together on the right. Eliminate D as there are three grey hexagons together on the left.
5	С	Eliminate A as the picture should have a grey rectangle at the bottom right. Eliminate B and D as the picture should have a white rectangle on the top left.
6	D	Eliminate A as there are 6 lines. Eliminate B as the orientation of the lines is incorrect. Eliminate C as there are missing shapes from the end of the 'spokes'.
7	А	Eliminate B and C as the circle with a dotted outline should be on the left. Eliminate D as there are two circles with dashes and one dot.
8	А	Eliminate B as the black rectangles should be upright. Eliminate C and D as the orientation of the pictures is incorrect.
9	С	Eliminate A, B and D as the picture should have three lines pointing south west to north east on the right of the picture.

#### Test 5

### Grids p.37

1	В	From left to right, the pictures are reflected.
2	В	From left to right, the number of grey squares reduces by two.
3	D	From left to right, the picture comprises the shapes added together.
4	А	From left to right, the white shapes become black and the black shapes become white. The arrows rotate by 180 degrees.
5	С	From left to right, the top left shape moves to the bottom right. The bottom left shape moves to the top right. The top right shape moves to the top left.
6	В	From left to right, the picture is rotated 90 degrees anticlockwise.
7	D	The pictures are moving in an anticlockwise pattern.
8	В	From left to right, the picture is reflected.

### Reflections p.39

1	А	Eliminate B and D as the picture should have a black triangle nearest to the central cross. Eliminate C as the dark grey and light grey triangles are in the wrong position.
2	С	Eliminate A as the picture is rotated. Eliminate B as the second smallest triangle should be dark grey. Eliminate D as the dark grey triangle is in the wrong position.
3	А	Eliminate B and C as the five-point star has been rotated, not reflected. Eliminate D as one of the shapes is different.
4	А	Eliminate B and D as the picture needs to have a dark grey shape in the bottom left. Eliminate C as the two white shapes in the bottom row should be identical.
5	D	Eliminate A, B and C as the second smallest shaded moon should be on the right.
6	В	Eliminate A and D as the scroll is in the wrong orientation. Eliminate C as the inner lines have been inverted.
7	С	Eliminate B and D as the top horizontal line should be dotted not dashed. Eliminate A as the thinnest vertical line should be on the right.
8	А	Eliminate C and D as the shapes on the 'stalks' are incorrect and they are upside down. Eliminate B as the trapezium has been inverted.

9	D	Eliminate A as the small chevron is pointing in the wrong direction. Eliminate B as the shading on the medium chevron is pointing in the wrong direction. Eliminate C as the shading on the large chevron should be vertical, not horizontal.
10	D	Eliminate A as the answer should have the shape with the graded shading in the bottom right. Eliminate B as the shapes are the wrong way round. Eliminate C as the stripes in the top shape should be horizontal.

### Sequences p.41

1	В	The black triangles increase by one with each picture and then decrease by one. The whole picture rotates by 45 degrees. The number of lines in the central shape increases by one and then decreases by one.
2	D	The shapes are being inverted at alternate intervals.
3	С	The cubes are facing to the left and then the right, and the number of squares in the cube shaded grey increases by one with each picture.
4	В	The large hearts are rotating 90 degrees anticlockwise. The smaller hearts are in alternating corners and alternate between black and white.
5	F	The arrows are moving one place to the right with each picture.
6	С	The flag shape is flipped horizontally with one line added with each picture. The line through the flag rotates by 45 degrees clockwise with each picture and alternates between the foreground and the background.
7	Α	The small triangles decrease by one with each picture in a clockwise pattern. One line is removed from the pentagon in a clockwise pattern.

#### Analogies p.43

13

1	D	The inner shape becomes the outer shape. The middle shape remains the same but is inverted. The outer shape becomes the inner shape and is inverted.
2	Α	The circles become triangles and vice versa.
3	E	The main arrow rotates 90 degrees anticlockwise, the little arrow stays the same and the medium-sized arrow rotates 180 degrees.
4	С	The shadings within the triangles are reversed.
5	F	The number of points on the stars doubles.
6	В	The whole picture rotates 90 degrees clockwise.
7	E	The whole picture rotates 180 degrees.

## Test 6 Odd one out p.45

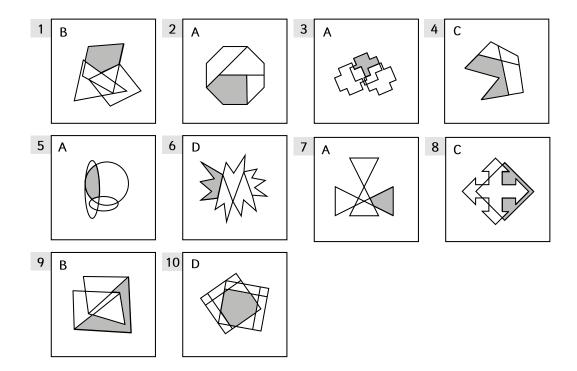
1	D	In all the other pictures, the black shape is in the background.
2	В	When rotated to a horizontal position, in all the other pictures, the arrows point to the right.
3	Е	In all the other pictures, the dots add up to nine.
4	Α	In all the other pictures, the shapes are identical to each other.
5	С	In all the other pictures, the shading consists of grey, white and dotted.
6	А	In all the other pictures, when rotated so the circle is at the top, the diamond shape is on the left.
7	Е	In all the other pictures, the grey shape is touching both white shapes.
8	С	In all the other pictures, the number of sides in the smaller shapes is one less than the number of sides in the larger shape.
9	А	In all the other pictures, when rotated so the black cross is at the bottom, the other shapes are on the left.

### **Rotations** p.47

1	А	Eliminate B as the line is convex in relation to the circle. Eliminate C as the small circle is too far away from the line. Eliminate D as the circle is too close to the line.
2	D	Eliminate A as the picture has been flipped vertically. Eliminate B as the picture has six grey squares in a group. Eliminate C as the picture has been flipped horizontally.
3	В	Eliminate A as each corner of the smallest triangle is not positioned on a different side of the grey triangle. Eliminate C and D as the small triangles have been flipped horizontally.
4	С	Eliminate A, B and D as the stripes are in the incorrect directions.
5	С	Eliminate A and B as these are rotated reflections. Eliminate D as there are two cuboids instead of one.
6	В	Eliminate A as the hexagon and the arrow have swapped places. Eliminate C as the trapezium is upside down. Eliminate D as the hexagon has been rotated by 45 degrees.
7	D	Eliminate A as there are two squares with solid lines next to each other. Eliminate B as there are only two dashed squares instead of three. Eliminate C as the dashed squares run from corner to corner.
8	Α	Eliminate B, C and D as the smaller shapes are pointing incorrectly.

9	В	Eliminate A as the black chevron has been reversed. Eliminate C as the moon shape has been reversed. Eliminate D as the shading in the larger chevron is incorrect.
10	A	Eliminate B as the pentagon and the square have been transposed. Eliminate C as the triangle is upside down. Eliminate D as the small circle is not dark grey.

#### Hidden shapes p.49



#### Analogies p.51

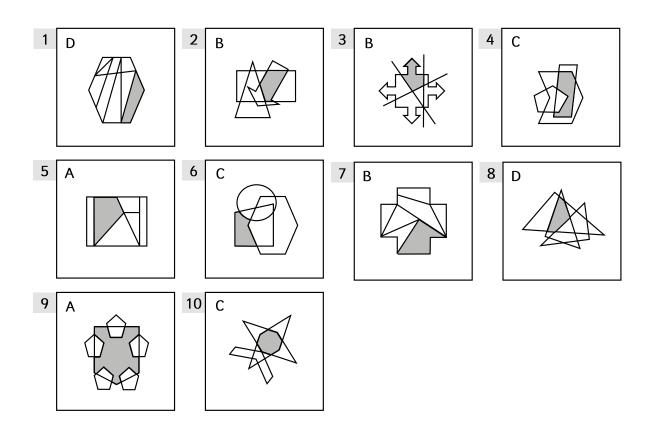
1	F	The arrow is rotated 90 degrees clockwise and the white and grey shading swap.
2	Е	The circles go from three to two and the lines go from two to three.
3	С	The bottom shape is inverted and the shading is replaced by the shading from the middle shape at the top. The central arrow is inverted but does not change colour.
4	D	The whole picture rotates 90 degrees clockwise.
5	В	The whole picture is rotated 90 degrees clockwise and the stripes are reversed.
6	А	The whole picture is rotated 180 degrees.
7	D	All the bars move one space to the left. The grey shading remains in the same position.

## Test 7

### Views p.53

1	А	Two cubes can be seen in each column.
2	С	Four cubes can be seen in column one, three in column two and three in column three.
3	В	Three cubes can been seen in columns one and two. Three cubes can be seen in rows two and three.
4	В	Four cubes can be seen in rows one and four. Four cubes can be seen in columns one and four.
5	D	Two cubes can be seen in each column and each row.
6	А	Four cubes can be seen in rows two and three and in columns two and three.
7	С	Three cubes can be seen in row one, three cubes in column one and two cubes in row three.
8	D	Eliminate A as there are only two rows of cubes. There is a gap in row four, so eliminate B and C.
9	А	There are two cubes in row one, three cubes in row two and two cubes in row three.

#### Hidden shapes p.55



### Families p.57

1	С	Both pictures contain a four sided shape with three arrows pointing inwards and one arrow pointing outwards. The arrows are white, they have straight ends and are on the side of the shape, not the corner.
2	D	Both pictures contain four solid lines, and two pairs of identical stars. There are two stars on each side of the long line and they are different styles.
3	F	Both pictures contain a thick rectangle with four identical shapes. When rotated, the shapes have the sequence of second tallest, third tallest, shortest then tallest (from left to right).
4	В	Both pictures contain a grey shape with one fewer circle at the bottom than the shape has sides.
5	А	Both pictures contain three identical shapes shaded light grey, medium grey and dark grey, from top left to bottom right. All outlines are solid.
6	D	Both pictures contain three arrows, two with two ends and one with one end. The lines with two ends are perpendicular and parallel to each other.
7	E	Both pictures contain four triangles containing two pairs of identical shapes. The same shapes are opposite each other and reflect each other.

### Sequences p.59

1	А	The central shape becomes the largest shape with the same shading. The small shape in the corner of the picture moves anticlockwise, then becomes the central shape.
2	Е	The white square is moving clockwise and the square behind it rotates 45 degrees clockwise. The black triangles move clockwise with each picture.
3	С	The pictures are in pairs and the arrows are elongated and rotate 90 degrees clockwise.
4	В	The arrows move down by one space with each picture.
5	С	The shading in the triangles on the top is moving forward with each picture and the shading in the triangles on the bottom is moving backwards with each picture.
6	А	With each picture, the suns become larger and the crescents become smaller; shadings alternate between black and white.
7	Α	The shaded part of the circle is being rotated by 45 degrees anticlockwise.