

Extended answers for Non-verbal Reasoning (Ages 9–10)

Odd one out pp.5–8

1	D	In all the other pictures, the inner shape is different to the outer shape.
2	D	In all the other pictures, the number of black circles equals the number of white triangles.
3	A	In all the other pictures, there are two thick, double-ended arrows, two lines with black circles and two regular arrows.
4	E	In all other picture, the stripes are pointing upwards to the right.
5	A	In all other pictures, the outlines have the sequence: thick black, thinner black, thinnest black, thick grey, thinnest grey.
6	E	In all other pictures, the outlines have the following sequence: thick black, thinner black, thinnest black, dashed and dotted.
7	C	In all other pictures, the inner shapes have the sequence: diamond, square, triangle and circle
8	D	In all other pictures, the number of shaded in triangles is the same above the line as below
9	E	In picture E, the interior arrows have been rotated.
10	B	In all the other pictures, the eyes are looking to the right.
11	E	The shapes are all circles but there is a square in picture E.
12	B	In all the other pictures, the direction of the arrows is clockwise.
13	B	In all the other pictures, there are the same number of spots in each half of the circle.
14	C	In all the other pictures, the wheels and the funnels are shaded the same.
15	A	Picture A is the only one not to contain a shape with a solid outline.
16	E	In all the other pictures, the points of the stars are in the gaps of the larger shapes. In E, the stars have also moved on one extra gap of the larger shape.
17	C	In all the other pictures, the 'eyes' are not central
18	B	The legs in picture B are pointing backwards.
19	D	In all the other pictures, the black quadrilateral is in the foreground.
20	E	Picture E contains a different shape at the end of the arrow.
21	D	In all the other pictures, the shapes are reflections of each other
22	A	In all the other pictures, the triangle with the diagonal shading is in the foreground.

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Views pp.9–12

1	B	Seven cubes in total can be seen from the top downwards, with a cube sticking out of the top, left- and right-hand side of the shape.
2	C	Five cubes can be seen from the top downwards, forming a T shape.
3	A	Seven cubes can be seen from the top downwards, forming a backwards C shape.
4	B	Five cubes can be seen from the top downwards.
5	A	12 cubes can be seen from the top downwards, forming a cross shape.
6	C	11 cubes in total can be seen from the right side, with two of those cubes sticking out of the top-left side and one cube sticking out from the top-right side of the shape.
7	D	Nine cubes can be seen from the left side.
8	D	Ten cubes can be seen from the top downwards, forming a C shape.
9	A	Ten cubes can be seen from the left side, with two rows of four cubes at the bottom and two cubes on the top.
10	D	16 cubes can be seen from the top downwards, forming a 4×4 square.
11	D	16 cubes can be seen from the top downwards, forming a 4×4 square.
12	A	Ten cubes can be seen from the right side, forming a U shape.
13	B	Ten cubes can be seen from the top downwards: eight cubes form a 2×4 shape and two cubes stick out at the front of the shape.
14	C	Six cubes can be seen from the right side.
15	C	12 cubes can be seen from the top downwards, forming a hollow square shape.
16	D	Nine cubes can be seen from the top downwards, forming a lower case 'e' shape.
17	A	Four shapes can be seen from the top downwards: two cubes and two cuboids.
18	B	Four shapes can be seen from the right side: three cubes at the bottom and a cuboid attached to the middle cube.
19	B	Seven shapes can be seen from the top downwards: five cubes and two cuboids, forming a chair shape.
20	D	Eight shapes can be seen from the left side; four cubes and four cuboids.
21	C	Eight shapes can be seen from the top downwards: two cuboids at the top, two cuboids at the bottom and four cubes in the middle.
22	C	Nine shapes can be seen from the right side.

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Grids pp.13–17

1	B	The outer line is dashed, then solid. The shape needs to be positioned in the top left.
2	B	The stripes are reversed, so the answer needs to have horizontal stripes on the left, vertical in the middle, then horizontal again on the right.
3	D	The colours are reversed, and the shapes are rotated 45 degrees clockwise.
4	A	Each square in the grid contains the same number of different objects.
5	E	The left-hand square is rotated 90 degrees clockwise.
6	D	Each left-hand square is rotated 180 degrees clockwise.
7	C	The shading is moving downwards.
8	C	Short arrows are rotating 45 degrees clockwise each time; the long arrows are rotating 45 degrees anti-clockwise each time.
9	E	There is one less column of rain. Each column is also one drop shorter.
10	A	The whole picture is rotated 45 degrees anti-clockwise each time.
11	A	Like a jigsaw, the pieces fit together.
12	B	The shaded shape on the right is an outline of the two shapes on the left.
13	C	The grid is read in an anti-clockwise direction. The colours move up by two spaces each time.
14	E	The shapes are reflected horizontally.
15	B	There are two balloons of each pattern each time in the grid.
16	C	The patterns are reflected horizontally.
17	C	The shapes are reflected horizontally and are moved to the opposite side of the box.
18	D	One extra quadrilateral with an inner circle is added and the colours are reversed at the bottom of the shape.
19	D	The shape is reflected horizontally.
20	E	The left-hand square rotates 180 degrees clockwise.
21	A	The triangle remains the same, the middle circles are transposed and the bottom circle remains the same. Pictures A and C are similar, but the answer is not C, as the stripey circle is not on top in this picture.
22	E	Two extra lines are added each time: A has four; B has no extra lines and one of the existing lines is shorter; in C, the middle lines are in the wrong position; in D, four extra lines are added. The answer is E.
23	A	The top-left bee moves to the bottom right.
24	B	The number of long oars is reduced by one and the number of short oars is reduced by one, eliminating A, C and E. The final picture should have three long oars and two short oars. The answer is B.

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Rotations pp.18–21

1	D	Eliminate A, B and C as the circles are in the wrong position in relation to the rectangle.
2	A	Eliminate B, C and D as the compass points in the pictures are incorrectly positioned.
3	A	The sequence has to be grey, spotted, grey, spotted, white, light grey.
4	B	Eliminate A as the eyes are different, C as the ears are in the foreground and D as the nose is round.
5	D	Eliminate A as there is no missing segment, B as the shading is different and C because the picture is a reflection.
6	B	Eliminate A as the mouth is different, C as the right pincer is open and D as there is a nose in the picture.
7	C	Eliminate A as there are four triangles. B because the picture contains a circle and D because the triangles are out of position.
8	B	Eliminate C and D as they have too many bold lines and A as it only has one dashed line.
9	C	Eliminate A because of the shading, B because the triangles are out of position and D because of the point at which the triangles join with the hexagons.
10	D	Eliminate A as there aren't enough white lines, and B and C as they are reflections.
11	A	Eliminate B because of the shading, C because of the dotted lines and D because some of the chevrons are pointing in the wrong direction.
12	D	Eliminate A and C because they have an incorrect number of rungs, and B because the rungs are in the background.
13	D	Eliminate A as the central objects are out of position, B as the circles are out of position and C as the central objects are positioned at the wrong angle.
14	A	Eliminate B as the pen markings are too faint, C as the rectangles are out of position and D as the pen markings are incorrect.
15	C	Eliminate A because the base is black, B because the triangle at the top is upside down and D because the weight on left is heavier than on the right.
16	B	Eliminate A, C and D because the lines are out of position.
17	A	Eliminate B, C and D because the shapes are out of position when the shape is rotated.
18	B	Eliminate A because the chevrons aren't moving clockwise, C because the circles are white and D because the triangles are moving anti-clockwise.
19	B	Eliminate A because of the shading on top of the egg-shaped objects, C because it is a reflection and D because of incorrect shading.
20	C	Eliminate A because the inner shape is a square, B because the inner circle is white and D because the shading is incorrect.
21	C	C is the only picture where the arrows are pointing in the right direction in relation to the triangles.
22	D	Eliminate A because the circles are not correctly enclosed, B because of the incorrect number of circles and D because the outer shapes are pointing downwards.

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Reflections pp.22–25

1	C	Eliminate A and D as the arrow is pointing downwards, and B as the inside circle is too small.
2	A	Eliminate B and D as the lightning bolts are facing upwards, and C as the shading is not a reflection.
3	A	Eliminate B as the heart shape is pointing downwards, C as the bottom of the shape has three bumps and D as the eyes are different sizes.
4	C	Eliminate A as the black shapes are behind each other, B as none of the shapes are in the correct position and D as the box has a greater height.
5	B	Eliminate A as the bottom part of the shape sticking out is longer, C as the top part of the shape sticking out is shorter and D as the top inner oval is vertical.
6	D	Eliminate A as the slanted inner shape is the second window, B as the wheels have an extra inner circle and C as the slanted inner shape is the fourth window.
7	D	Eliminate A as the inner white oval is horizontal, B as the top inner circle is black and C as the outer shape is rotated 180 degrees.
8	B	Eliminate A as the trees are positioned away from dashed line, C as the line is dotted and D as the shape is identical to the shape in the left box.
9	A	Eliminate B as the pan head is positioned top right, C as the pan head is positioned top left and D as the egg is flipped.
10	B	Eliminate A as the three middle arches have a thick outline, C as the arches have no rectangles underneath them and D as it only has five arches.
11	A	Eliminate B as the numbers are flipped, C as the '4' is not correctly reflected vertically , and D as the '6' is not flipped horizontally.
12	C	Eliminate A as the shape is identical to the shape in the left box, B as the colours of the shapes in the top row start with dark grey and D as the door handle is vertical.
13	C	Eliminate A as the swirled doughnut is top left, B as the chocolate doughnut is bottom right and D as the sprinkled doughnut is bottom right.
14	A	Eliminate B and D as two of the bottom circles are black, and C as the inner rectangle shape has been flipped horizontally.
15	B	Eliminate A as the black arch should be further to the left, C as the black arch should be further to the right and D as the bees are in different positions.
16	D	Eliminate A as 'photo' is identical, B as black lines are at the top of the inner circle, C as the sun is in the wrong position.
17	D	Eliminate A and B as the balloon on the right is light grey, and C as the dark grey balloon is not in the front of the picture.
18	C	Eliminate A and B as the label hasn't been reflected, and D as the triangle is positioned top left.
19	B	Eliminate A as the shape is identical to the shape in the left box, C as the spoon is pointing left and D as the knives are in the wrong order and are facing the wrong way.

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Reflections pp.22–25

20	D	Eliminate A as the face with dashed and dotted hair is top right, B as one face with dotted hair is top left and C as the shape is identical to the shape in the left box.
21	D	Eliminate A and C as the crooked line overlaps the bottom of the graph, and B as the arrows point right.
22	A	Eliminate B as the shape is identical to the shape in the left box, C as the door is too far right and D as the blades are not on an angle.

Families pp.30–35

1	E	A white lightbulb with five solid lines surrounding it and two black dashes at the base of the lightbulb.
2	D	The answer contains four shapes: a black crotchet, a white minim, a black quaver and black joined quavers. When rotated individually, they are in the same orientation as the pictures on the left.
3	A	There are three flowers, each with a single black dot in the middle and five leaves.
4	F	The rosette shape has two inner rings and an inner frilled line. The ribbon end has two points.
5	A	The hat shape consists of a top crown shape and bottom rim shape. The crown shape contains two parallel lines that are the same distance apart.
6	C	The answer is C because there are the same number of eyes as antennae.
7	B	All windows are square and are divided into four sections by two crossed lines.
8	C	The sweet shapes are circular, triangular, oval and rectangular. The sweet decorations are dotted, wavy, diamond and hatched.
9	C	There are nine planes pointing to the right.
10	B	There are five inner shapes and one shape attached to the top point of the triangle. The shapes inside and out of the triangle are identical in size and colour.
11	D	The answer is a 3D shape with a black dot at each vertex.
12	E	The trophy shape has a star point at the top, handles pointing upwards and the base is made up of two rectangles. Each shape of the trophy is a different colour.
13	E	The number of vertices is equal to the number of dots inside the shape.
14	F	The shape is rotated.
15	F	There are 10 studs in total on the building block shapes.
16	D	There are four arches of different colours with a flat base at the bottom of the picture.
17	B	The round bauble has five different lines (matching the pictures on the left) and string at top.
18	A	The shape is rotated.

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Families pp.30–35

19	E	The kite shape is divided by lines of symmetry and the number of segments is equal to the number of bows on the string line.
20	C	The shape is rotated.
21	D	The shape is identical to the pictures on the left, and the outer shape has a solid line.
22	D	The shape is rotated.
23	E	There are five different pens alternating in facing the opposite direction.

Combined shapes pp.36–41

1	B	The square is inside the four-point star.
2	D	There are three grey acorns with filled cups. Two have a hatched fill and one has a cross-hatched fill. The three acorn cups have narrow stems.
3	D	The inner shape is thick black ring with eight lines attached. The outer shape is ring with tapered squares attached all around the outside.
4	B	The bird shape is facing right with three arches forming the tail. The weather vane has two arrows, one diamond and one circle attached, all matching the weight and direction of the second shape on the left..
5	A	The inner pale diamond is underneath the full cross shape.
6	E	The grey diamond shape consists of five triangles at the top and three elongated triangles at the bottom.
7	C	The three 'person' shapes are made from three curved shapes rounded at the top. Two person shapes overlap one person.
8	B	The combined shape has a five-point star in the middle, with its point at the top. Four smaller stars are at each compass point. Lines within the shape are solid, not dotted.
9	F	The clown face has a four-point star for its left eye. The black circular nose has an inner white dot on the top left, and the circles at the end of the hat are black.
10	C	The dotted rectangle overlaps the striped rectangle.
11	C	The castle shape has 20 windows and a curved, vertically striped door.
12	D	The tree shape has the darkest circle overlapping the four lighter circles. The lighter circles match the shading given in the second shape on the left.
13	F	The final tiled shape has the inner eight black circles arranged in a cross shape.
14	F	The boat shape has three windows, a black stripe on the chimney, and the cargo consists of three tiers of light and dark grey blocks.
15	A	The final shape has 'R', '1', '3' and '5' in the top row, and '2', '4' and '6' in the bottom row when 'P', 'N' and 'D' have been subtracted.

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Combined shapes pp.36–41

16	A	The mouse shape has six whiskers, its ears are upward-pointing triangles and its eyes are upward-pointing arrows.
17	E	The final shape is an eight-point star with an inner white square.
18	E	The final shape is a black circle with groups of dots behind a white ellipse bearing a white circle near the bottom of the ellipse, and a grey pincher shape that opens to the bottom left.
19	A	The final shape consists of a circle with three broken inner circles attached to each other with lines.
20	E	The three-link anchor chain is positioned diagonally from top left to bottom right. The cross bar is near to the top, and the arrows are pointing upwards.
21	B	The final shape consists of six rectangles only: two inner rectangles form a goal in each larger rectangle.
22	D	The final bike shape is facing right with spokeless wheels and no pedals.
23	A	The final shape comprises two large, overlapping triangles – one pointing up and one pointing down.

Sequences pp.42–45

1	B	The blocks move along the graph by one space each time. At the end of the row, the block moves to the start of the graph. The block colours consistently stay in the same pattern.
2	D	The liquid in the cup shape gets lower each time and one bubble is subtracted from the liquid as the sequence progresses.
3	C	The fifth square is a reflection of the first square.
4	D	The left side of the domino gains one dot and the right side loses one dot each time.
5	D	The line with a circle rotates 90 degrees anti-clockwise and the centre triangles alternate between large and small.
6	F	The sequence alternates between a large and small Rubik's cube each time, and the pattern of grey and white squares moves orientation within the cube.
7	F	The diamond shape becomes black from the middle to outer diamond in sequence. The dots at the top and bottom of the rectangle alternate in colour each time.
8	A	The shape rotates 45 degrees clockwise each time.
9	E	The colours move along the parachute by one block each time. At the end of the parachute, the colour moves to the block at the beginning.
10	A	One slice is subtracted clockwise from the pizza each time. A second circle is added to a slice anti-clockwise each time.
11	C	The direction of the truck shape alternates and one horizontal line is added each time.

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Sequences pp.42–45

12	B	The bag rotates 90 degrees anti-clockwise and one different inner shape is added each time.
13	E	The orientation of the door shape alternates from left to right and one light grey panel is added to the door each time.
14	C	The line type and colour of the three hearts alternates each time, with the outer line type moving to the next inner heart. The innermost heart line type then becomes the middle heart line type.
15	D	The shooting star shape moves 90 degrees clockwise each time and the colour alternates between dark grey and light grey.

Analogies pp.46–49

1	B	The arrow moves horizontally to touch centre of target.
2	D	The shape rotates 180 degrees and the direction of shading reverses.
3	E	The colour of shapes and lines flip from black to white or white to black.
4	C	The shape is enlarged.
5	F	The white rectangle moves inside to the top of the black rectangle, and the top-right shape moves inside to the bottom of the black rectangle.
6	A	The number of candles becomes number of cake tiers; the number of tiers becomes the number of candles.
7	E	The shape rotates 180 degrees and the colour of the shapes and lines flip from black to white or white to black.
8	A	The shape rotates 180 degrees and is enlarged.
9	B	The shape flips vertically and two curved lines are removed.
10	E	The plane shapes flip horizontally while the dashed lines change to dotted lines, and vice versa
11	F	The shape rotates 90 degrees clockwise.
12	C	Shape rotates 180 degrees and the pocket shape with four-hole button is added.
13	D	The test tube shapes move along the rack in order, with the end tube moving to the beginning.
14	B	Nose flip horizontally, arms move from up to down. One button is removed from the bottom circle.
15	F	The shape rotates 90 degrees anti-clockwise.

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Cubes pp.50–52

1	A	Eliminate B as one face has a striped fill, C as there are two white faces and D as there are two mid-grey faces.
2	B	Eliminate A and D as the diamond and triangle touch, and C as the chevron and circle touch.
3	A	Eliminate B and D as the eight-point star and 24-point star touch, and C as the five-point star and four-point star touch.
4	D	Eliminate A as the blank rectangle and five-line rectangle touch, B as the two-line rectangle and three-line rectangle touch and C as the one-line rectangle and four-line rectangle touch.
5	B	Eliminate A as the oval is black and the circle is grey, C as the oval is black and the cross is grey and D as the cross is grey.
6	A	Eliminate B as the minus sign and brackets touch, C as the multiplication sign and equals sign touch, and D as the add sign and divide sign touch.
7	B	Eliminate A and D as the grey face and the dotted line touch (and the dotted line has a different orientation), and C as the letter 'A' and the checked square touch.
8	C	Eliminate A as the sixth-black square and third-black square touch, B as the sixth-, fifth- and fourth-black squares touch and D as first-black square and fourth-black square touch.
9	D	Eliminate A and C as the light grey flower and the white flower touch, and B as the flower with two grey petals and the flower with one black petal touch.
10	D	Eliminate A as the square and the hexagon touch, and B and C as the line and triangle touch.
11	D	Eliminate A as the heart and the arch touch, B as the lightning bolt and diamond touch and C as the crescent moon and the sun touch.
12	C	Eliminate A as the black corner arrow and the curved arrow touch, B as the arrows on each face are in the incorrect orientation and D as the straight double arrow and right-angled double arrow touch.
13	A	Eliminate B and C as they each have two black-line squares, and D as it has a dot-and-dash line square.
14	A	Eliminate B and C as the white circle and circle with two black segments touch, and D as the black circle and circle with three black segments touch.
15	B	Eliminate A and D as the thin star and black star touch, and C as the narrow star and dark-grey star touch.