11+

eleven plus
LONDON

Non-Verbal Reasoning - A Complete Guide

11 Plus - Non Verbal Reasoning

Non Verbal Reasoning (NVR) is used to test a child's ability to logically work out problems which are shown pictorially as sequences of shapes.

There are a number of different NVR question types The table below shows these types and how they are typically described in a question or section:

| Type	Description
1 **'Like Shapes'**	Look at the two shapes separated by an arrow on the left. The first shape is related to the second one in some way. To the right of these shapes, there is a third shape followed by an arrow and five other shapes. One of these five shapes is related to the shape before the arrow in the same way as the two shapes on the left are related to each other. Choose which one.
2 **'Odd One Out'**	Choose which one of the pictures is most unlike the other four.
3 **'Rotations'**	Only one of the five figures to the right of the dotted line can be rotated to make the figure on the left. The others are mirror images. Choose which figure can be rotated to make the figure on the left
4 **'Code Breaker'**	To answer these questions, you need to work out a code. You are given three or four boxes on the left followed by a separate box on the right of the dividing line. Each box on the left has a pair of letters in it which are a code for the shape or shapes in that box. You need to work out the code that applies to the shapes on the left and then choose which pair of letters should be given to the shape or shapes in the box on the right.
5 **'Missing Sequence'**	The five squares on the left contain shapes arranged in order to form a sequence. One of the squares is missing. Choose which one of the five squares on the right should take the place of the empty square.
6 **Missing Square**	Each question has a group of either four or nine squares on the left. One of the squares has been left blank. Choose one of the five options on the right to best complete the group.
7 **'Most Like'**	The two figures on the left are alike in some way. Choose which one of the five figures to the right of these is most like the first two figures.
8 **'Nets'**	Which one of the five 2D nets shown on the right can be folded to make the 3D cube on the left?

- The figures and diagrams consist of <u>lines, shapes and shading/patterns.</u>
- The shapes can shift in various ways. (<u>rotate, reflect and transpose</u>).
- The shapes can change in many ways. (<u>increase/decrease, add and copy</u>).
- They can consist of a <u>movement, size or number sequence</u>.

Below is a guide showing the figures and diagrams, with shapes and shifts explained more clearly:

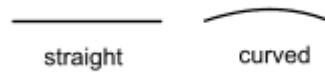# COMPONENTS 1

LINES - various line shapes and line types are used:

Line types:
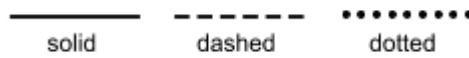
Line thickness:

Line shapes:

Examples of other line shapes:

SHAPES - Non-Verbal Reasoning shapes can be thought of as two different groups:

Standard (regular) shapes:

Non-Standard (irregular) shapes:

COMPONENTS 2

SHADING & PATTERNS - Shapes can be filled in a variety of ways:
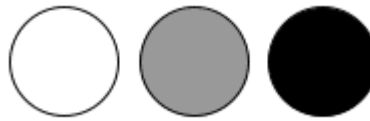
Solid shading:
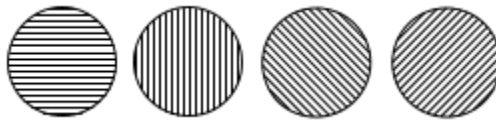
Line shading:
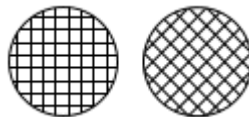
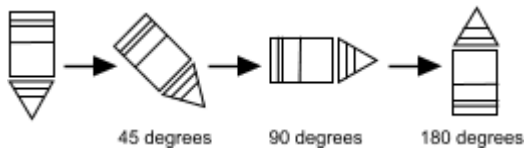Lattice patterns:

Irregular patterns:

Spotted patterns:

SHIFTS

In Non-Verbal Reasoning questions, shapes can shift in various ways. They can *transpose, rotate, reflect* or *overlay*.

TRANSPOSE
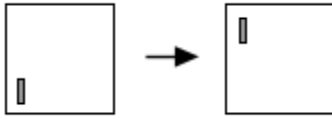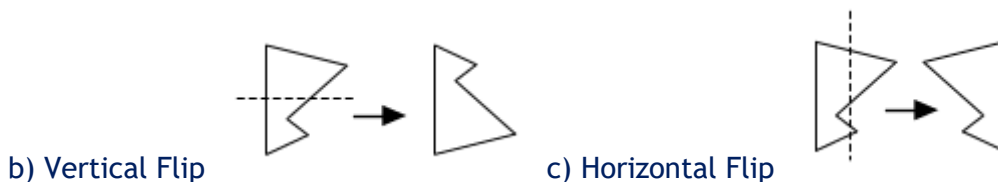
Shapes can move vertically, horizontally or diagonally

- -

ROTATE

45 degrees   90 degrees   180 degrees

Shapes can move Clockwise or Anti-Clockwise

- -

REFLECT

a) Mirror Reflection

Shapes can be mirrored using a line of Reflection (the shape will reflect and move from its original position)

b) Vertical Flip   c) Horizontal Flip

The line of Reflection runs through the shape (the shape will invert and stay in its original position)

- -

OVERLAY
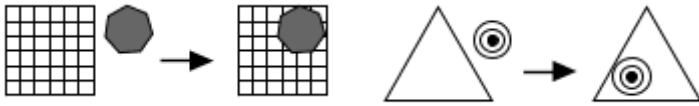
Shapes can overlap each other .....or merge together

MANIPULATIONS

Shapes can be changed and manipulated in a variety of ways.

INCREASING / DECREASING - A shape can change in size or transform by squashing and stretching

enlarging/ reducing   squashing/ stretching
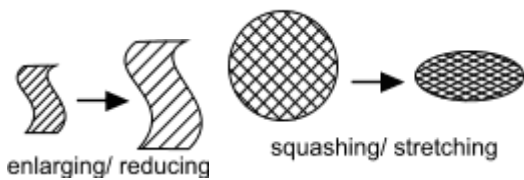
ADDITION - One or more new shapes can change the original shape
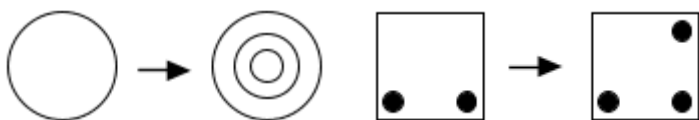
1. The original shape can be copied once or more often
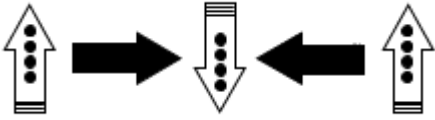2. The number of shapes can change in regular intervals

DEDUCTION - Parts can be removed to create a new shape

or

SEQUENCES

Shapes can make a sequence (pattern) by either repeating the same movement (or change to the components) or by increasing/decreasing in size or numbers in a regular interval

MOVEMENT SEQUENCE

Repetitive movement through rotation - 90 degrees clockwise. The shading also alternates in the above example.

SIZE AND NUMBER SEQUENCE

growing/ reducing in size   increasing/ decreasing in numbers
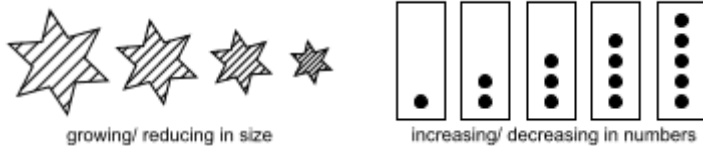
CHANGES

Be aware that more than one change can happen in Non-Verbal Reasoning questions. In easier questions you might just have one or two changes that happen to shapes, however questions with as many as 5 different changes are more complex to solve and more practice is needed to be able to identify these changes quickly.

Non-Verbal Reasoning
Strategies For Each Question Type

In Summary:

Non-verbal reasoning is problem-solving based around pictures, diagrams and shapes, rather than words. Unlike verbal reasoning, it's not as reliant on the English language; rather, the questions use drawings, shapes or codes, and your child will need to work out sequences, similarities and differences between these figures or break the code.

Non-verbal reasoning tests are designed to see how your child can use critical thinking and logic to solve problems

- Timed sections

- Read through example

- Complete practise questions (watch out for correct place on answer sheet)

- Work through section

- Time calls given at half way through and 1 minute to go (time to start guessing)

Instructions

In each of the rows below there are five figures. Find one figure in each row that is **most unlike** the other four and **mark its letter on the answer sheet.**
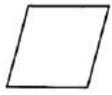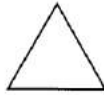
Example

a   b   c   d   e

Answer: b

Example

a   b   c   d   e

Practise
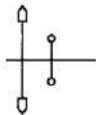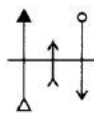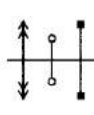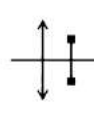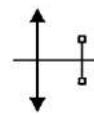
a   b   c   d   e

Top tips!

- **Most** unlike – may be two that are very similar
- Cross out ones that don't fit first

- Instructions

To answer these questions you have to work out a code. In the boxes on the left are shapes and the code letters that go with them. The top letters mean something different to the bottom ones. You must decide how the letters go with the shapes. Then find the correct code for the test shape from the set of five codes on the right. Mark its letter on your answer sheet.

Example 1

TEST SHAPE

Answer: b

Both squares have a Y at the top but the circle has an X, so the top code must be for shape. Both white shapes have an S at the bottom, but the shaded shape has a T, so the bottom code must be for shading. The test shape is a shaded circle so its code letters must be X for circle and T for shading, and *b* has been marked on the answer sheet.

Example

Practise

Top tips!

- Choose one code at a time
- What have the shapes with the same code got in common?
- Repeat for second code
- Cross out ones that don't fit

Instructions

On the left of each of the rows below there are two figures that are alike. On the right there are five more figures: find which of these is **most like** the two figures on the left, and mark its letter on your answer sheet.
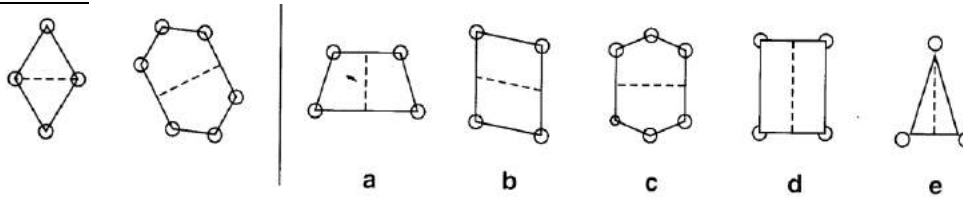
Example

a   b   c   d   e

Answer: c

Example

a   b   c   d   e
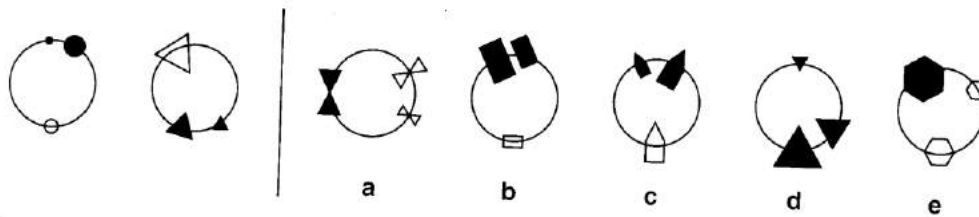
Practise

a   b   c   d   e

Top tips!

- **Most** like, may not exactly fit the same rule
- Look really carefully at the shading, sizes etc for red herrings
- If struggling, cross out ones that don't fit and guess between the ones that are left

Instructions

To answer these questions you have to work out a code. On the left are some shapes and the codes that go with them. You must decide how the code letters go with the shapes. Then find the correct code for the **test shape** from the set of five codes on the right. Mark its letter on your answer sheet.

Look at **Example 1**:

			TEST SHAPE					
△	F							
▲	G		▲	H	G	J	F	K
△	F			a	b	c	d	e

Answer: b

Now decide what the code letters mean. F must mean a white triangle and G must mean a black triangle. So the test shape must have a G code and b has been marked on the answer sheet.

Example

	V S					
	W T	XS	XT	WT	WS	VT
	X S	a	b	c	d	e

Practise

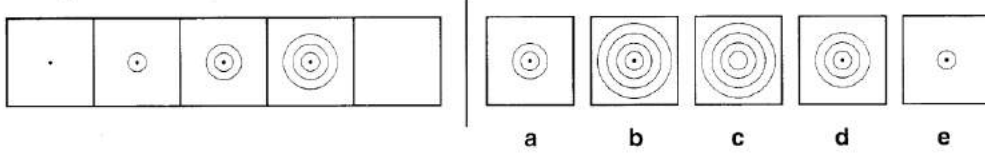|						
	X L R					
	Y M S					
	X N R	YNS	YMR	XMS	XNR	XMR
	X O S	a	b	c	d	e

Top tips!

- Choose one code at a time
- What have the shapes with the same code got in common?
- Repeat for second code
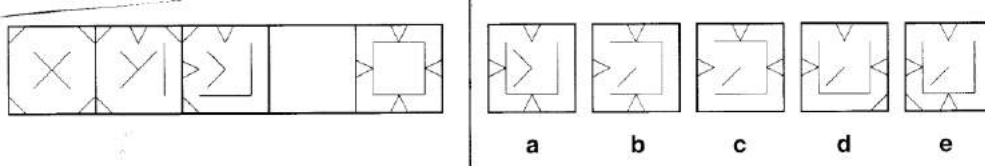- Cross out ones that don't fit

- **Instructions**

To the left in each of the lines below there are five squares arranged in order. One of these squares has been left empty. Find which one of the five squares on the right should **take the place** of the empty square and mark its letter on your answer sheet.
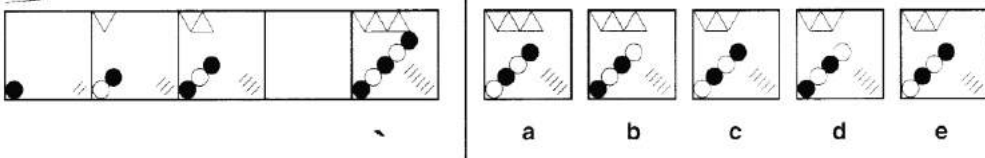
Example

a   b   c   d   e

Answer: b

Example

a   b   c   d   e
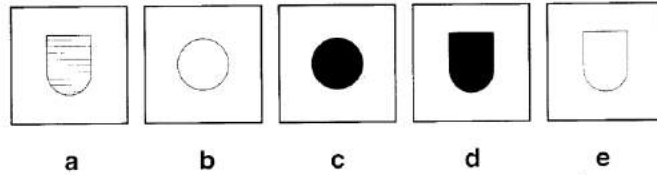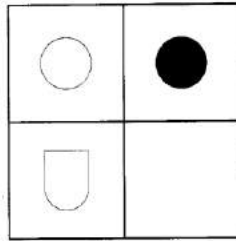
Practise

a   b   c   d   e

Top tips!

- Often involves counting lines, shapes etc
- Look out for patterns with shading and direction
- If the missing box is in the middle look at the boxes before **and** after
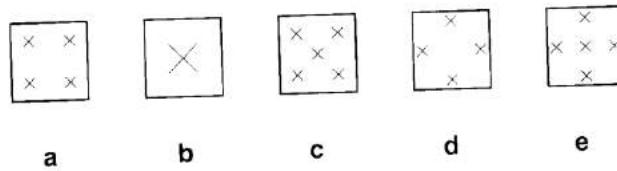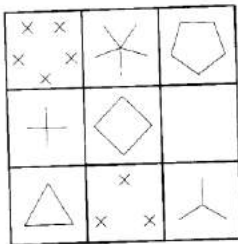
Instructions

In the big square on the left of each line below one of the small squares has been left empty. One of the five figures on the right should fill the empty square. Find this figure and mark its letter on the answer sheet.
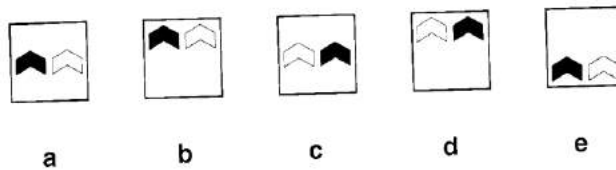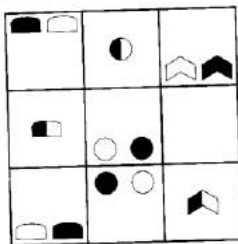
Example

a   b   c   d   e

Answer: d

Example

a   b   c   d   e
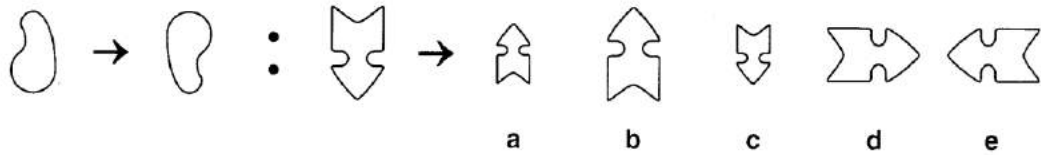
Practise

a   b   c   d   e

Top tips!

- Look for changes in number, position in the square, direction, shading
- Look at the grid vertically, horizontally, diagonally

Instructions

On the left of each of the rows below are two shapes with an arrow between them. Decide how the second is related to the first. After these there is a third shape, then an arrow and then five more shapes. Decide which of the five shapes goes with the third one to make a pair like the two on the left. Mark its letter on your answer sheet.
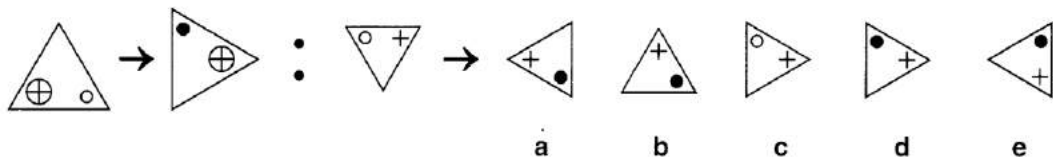
Example

a   b   c   d   e

Answer: b

Example

a   b   c   d   e
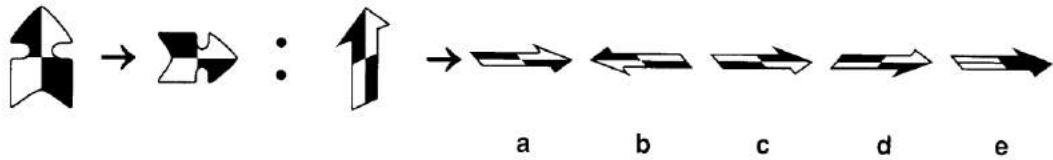
Practise

a   b   c   d   e

Top tips!

- Look for direction, position, shading
- identify how it has changed and apply the same rule