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Non-Verbal Reasoning Overview for GL Assessment / CEM 11 Plus Exams



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What is Non-Verbal Reasoning (NVR)?

What is NVR

- Non-verbal reasoning?

- It is a way of testing your intelligence using visual diagrams, and is not dependent on a detailed understanding of language.
- It is fun and uses diagrams.
- You can learn what to look out for to be able to answer the questions- see our checklist later on!



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NVR Question Types



NVR Question Types

Here are some of the common question types:

- Rotation
- Reflection
- Cube Nets 3D
- Aerial view of combined shapes – 3D
- Complete the Shape (Square, triangle) 2D
- Shape within a Shape
- 2 Shapes Together
- Complete the Series
- Odd One out
- Analogies
- Codes
- Hole Punching

Please note that the titles of the questions may be different, however, they are the same style of question



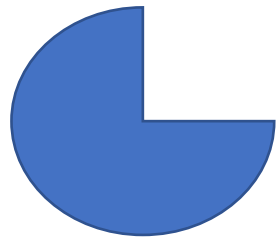
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Rotation



Rotation

- This is when you move a shape or a combination of shapes around a point:



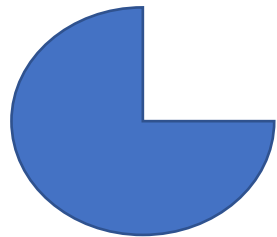
Now we will rotate it





Rotation

- This is when you move a shape or a combination of shapes around a point:



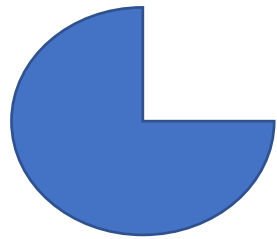
Now we will rotate it





Rotation

- This is when you move a shape or a combination of shapes around a point:



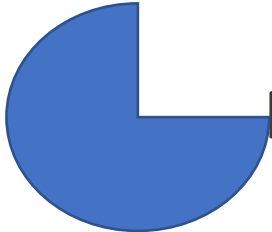
Now we will rotate it





Rotation

- This is when you move a shape or a combination of shapes around a point:

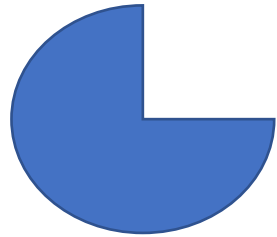
-  Now we will rotate it





Rotation

- This is when you move a shape or a combination of shapes around a point:



Now we will rotate it





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Reflection



Reflection

- Images are reflected when you look in the mirror.
- There will often (but not always) be a dashed line to show where the mirror is
- Top Tip: Please take note that where the dashed line is, affects the reflected images.

Example 1

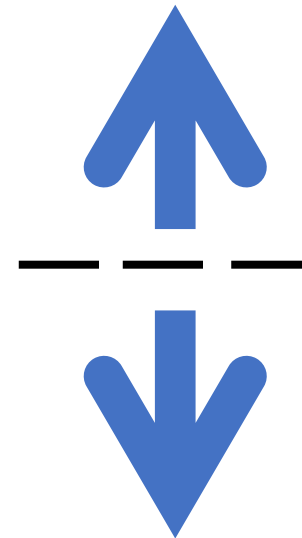
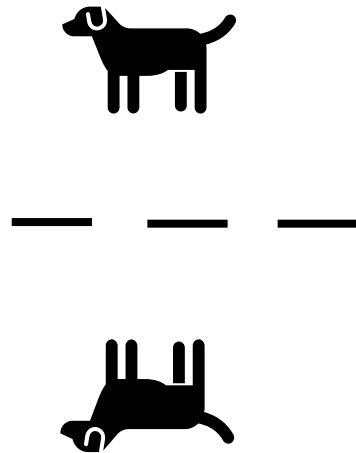


Reflection



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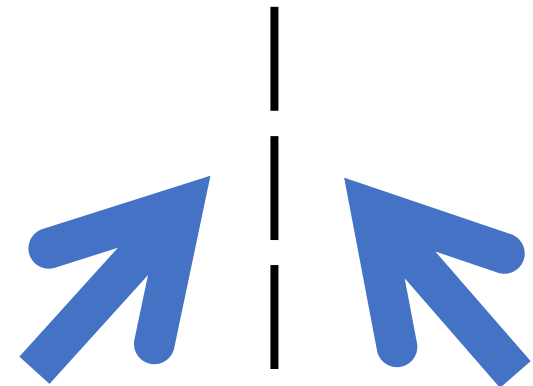
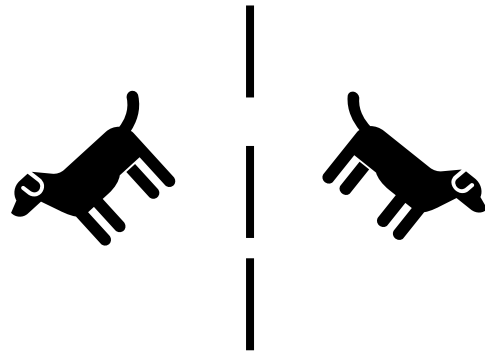
Example 2



Reflection

Example 3

See how the images reflect when they are on the diagonal.



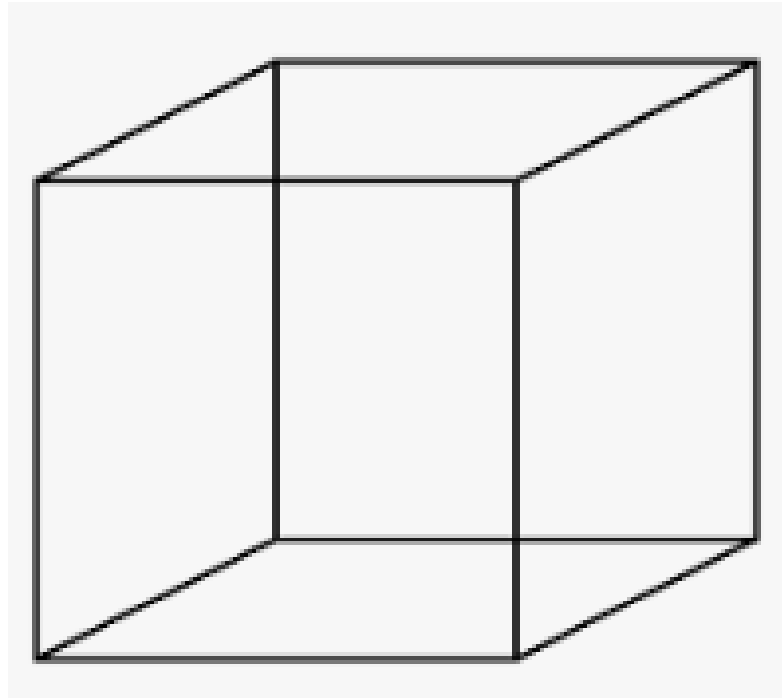


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Cube Nets

Cube Nets

This is a cube when it is made



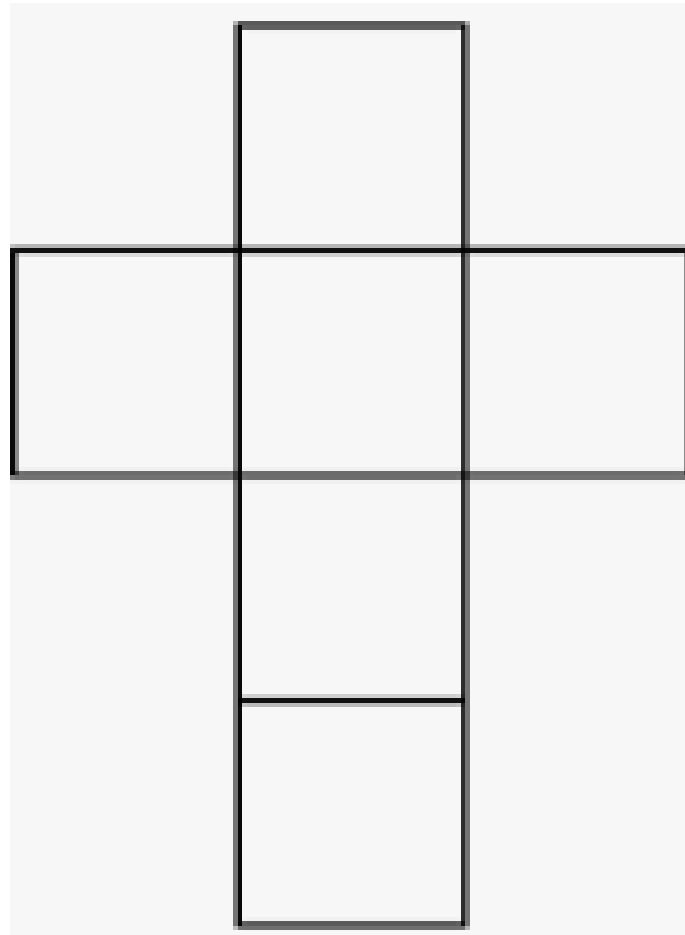
Cube Nets



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This is a cube when it is opened and flattened.

This is a cube net.

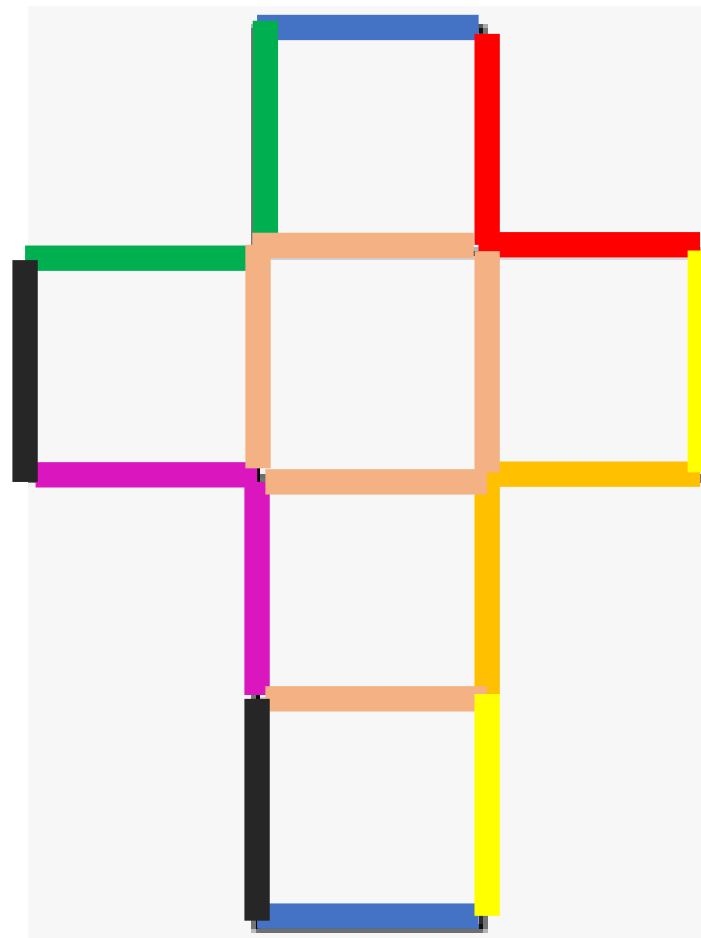




Cube Nets

Top Tip: Understand and learn which sides touch when the cube is closed.

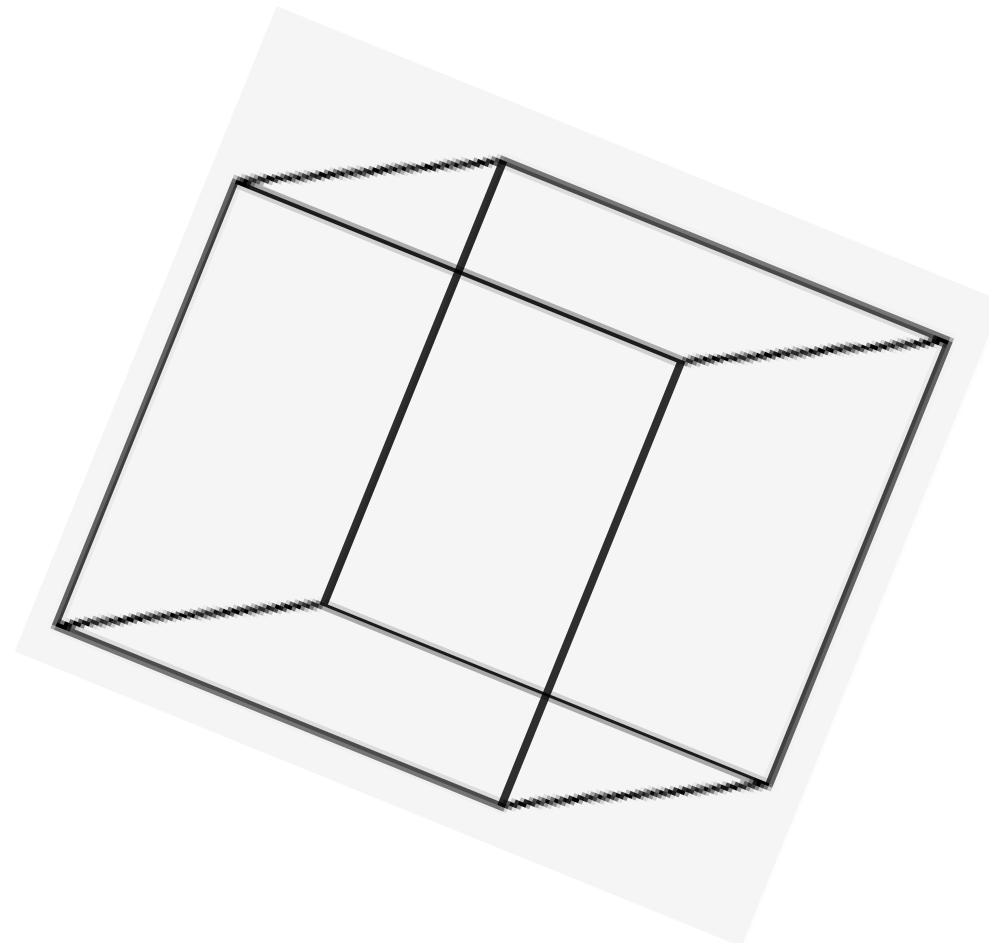
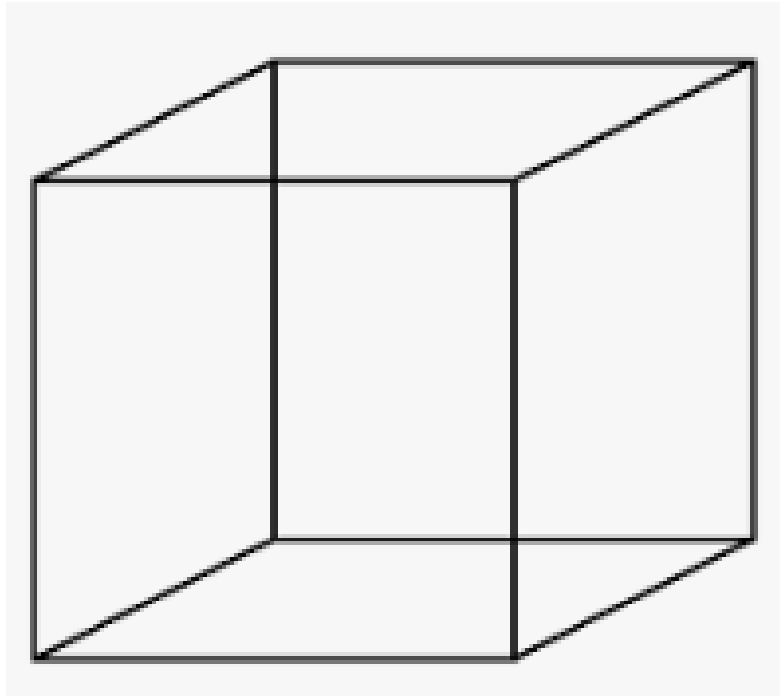
- Try and build one!





Cube Nets

Remember which sides touch and remember that cubes can be rotated





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3D Shapes



Aerial View of 3D Shapes

- You could be asked many different types of questions relating to 3D shapes and combinations of 3D shapes.

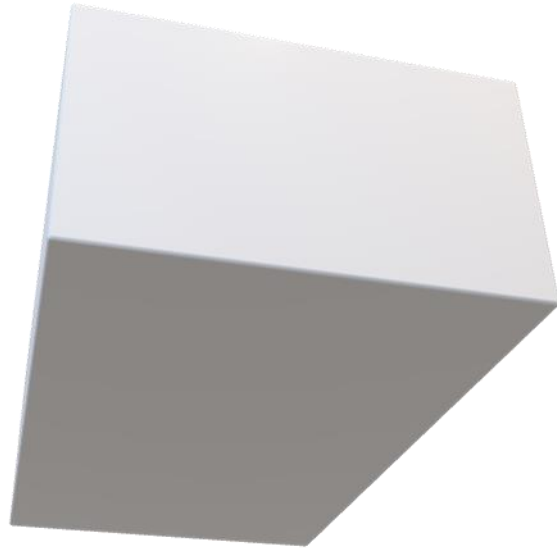
Including:

- What does the image look like from above?
- How would the image look if it is rotated?
- How do a set of images look when they all combine together to make a larger 3D block?

Top Tip: The key is that you need to think in 3D



Aerial View of 3D Shapes



Top Tips:

- Think in terms of different views of the same shape (from above, from the side)

Think of how shapes come together to and how they would look from certain views (e.g. one shape in front, the shapes are parallel)



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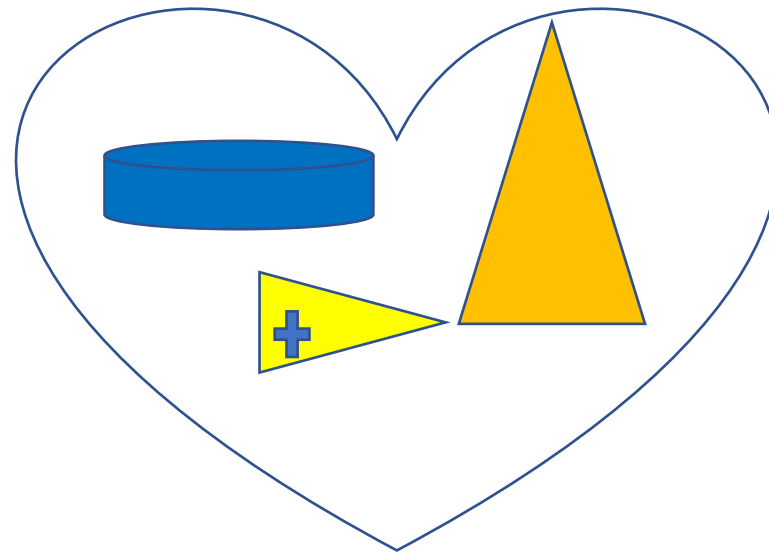
Shape within a Shape

Shape within a Shape



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- Find the yellow triangle within the heart

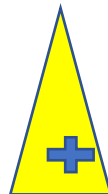


Shape within a Shape



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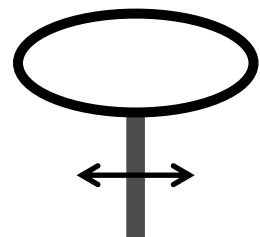
- Remember it may be a different size and a different direction





Shape within a Shape

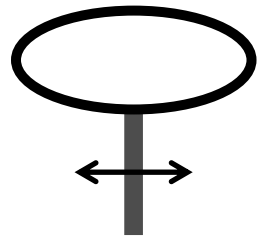
- Some are more difficult to see than others
- Find this shape within A- E options on next slide





Shape within a Shape

- Some are more difficult to see than others
- Find this shape within A- E options on next slide

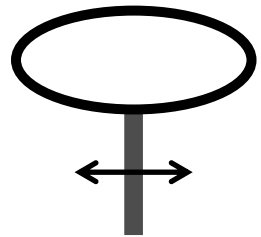


<p>A:</p>	<p>B:</p>	<p>C:</p>	<p>D:</p>	<p>E:</p>
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Shape within a Shape

- A is the answer- even though you cannot see the whole oval, the arrow and the thick lines are all in the correct place

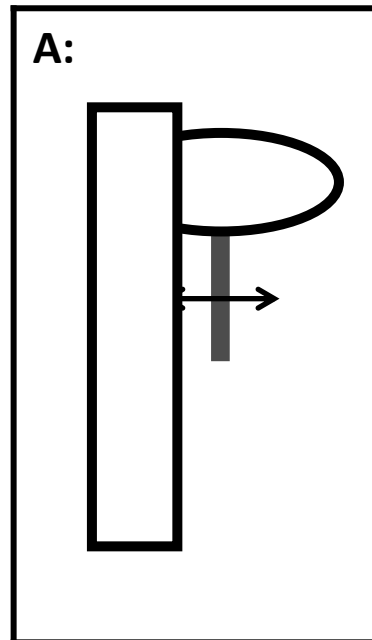
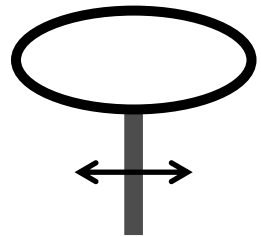


<p>A:</p>	<p>B:</p>	<p>C:</p>	<p>D:</p>	<p>E:</p>
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Shape within a Shape

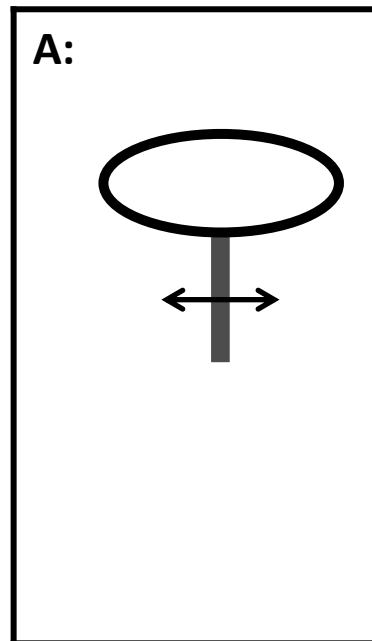
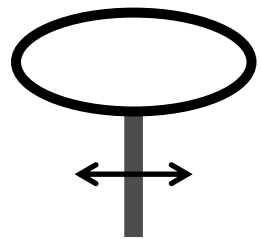
- A is the answer- even though you cannot see the whole oval, the arrow and the thick lines are all in the correct place





Shape within a Shape

- Take the rectangle away
- See it is the same shape





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Complete the Series and Odd One Out

Complete the Series

Odd One Out



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- These are 2 types of questions where you have to look for patterns and relationships of one thing to another
- Complete the Series asks **you to find the image that fits in the series**
- Odd One Out ask **you to identify which image does not fit in**
- **Both use the same skills**



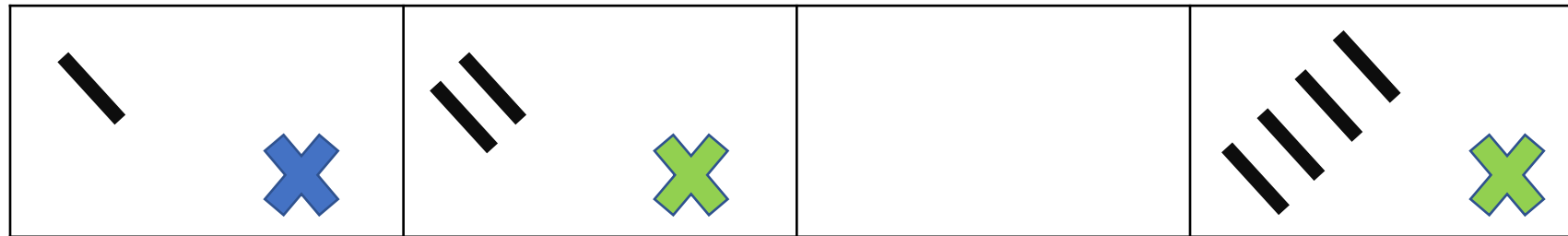
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Complete the Series



Complete the Series

Complete the Series Example



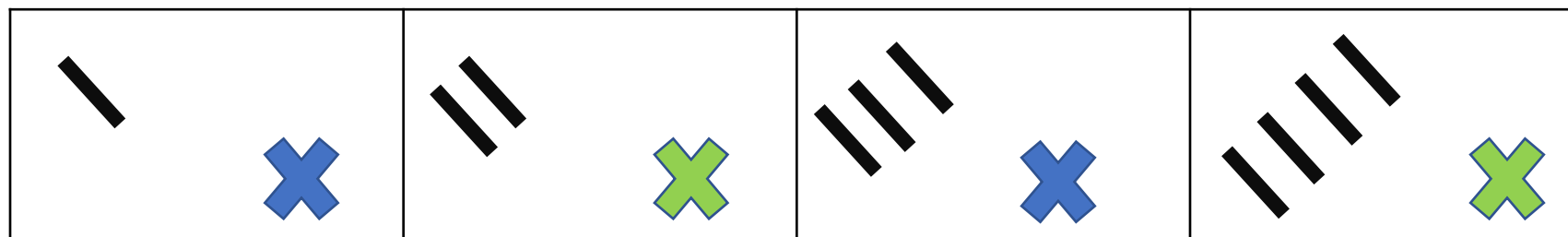
Answer options are below:





Complete the Series

Complete the Series Example



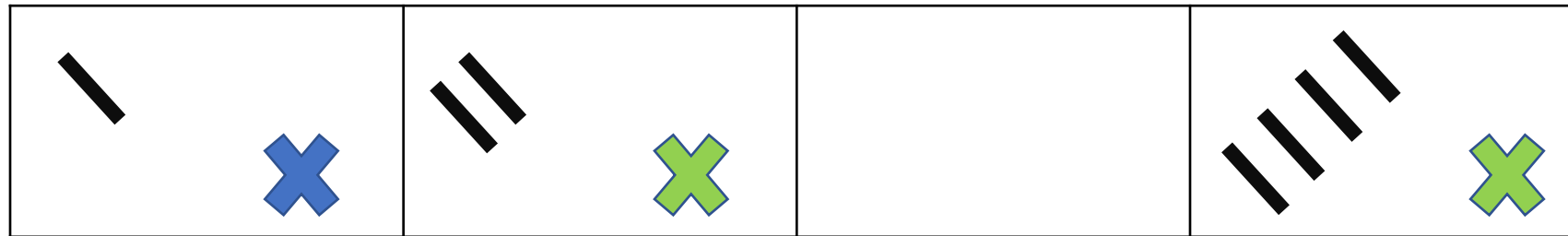
The answer is B





Complete the Series

Complete the Series Example



The answer is B: The lines are increasing in number and the crosses are blue then green, blue then green









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Odd One Out

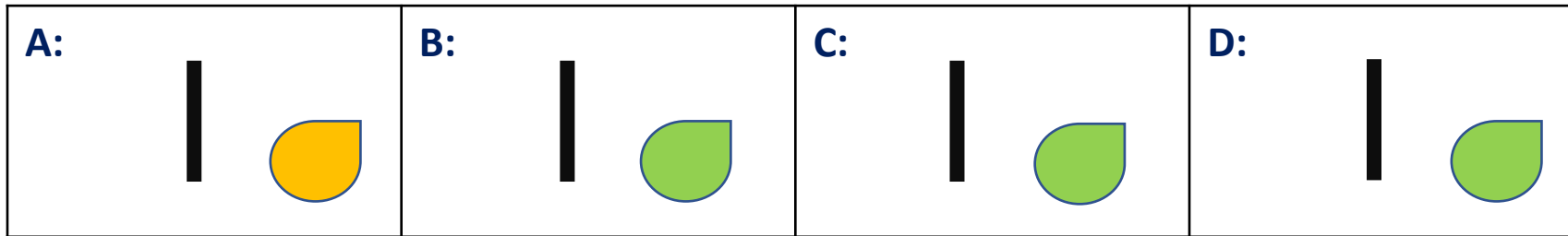
Odd One Out

Odd One Out Example

A: 	B: 	C: 	D: 
------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------

Odd One Out

Odd One Out Example



The odd one out is A because of the orange balloon





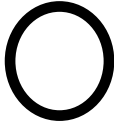

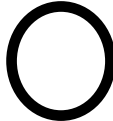
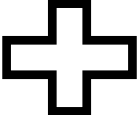


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Complete the Shape








Complete the Shape

- It is not important what the shape is, you are just looking for patterns again



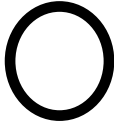

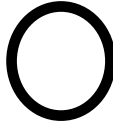
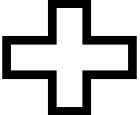


- Answer options

A: 	B: 	C: 	D: 	E: 
-----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------








Complete the Shape

- Not important what the shape is, you are just looking for patterns again









- The Answer is D

A: 	B: 	C: 	D: 	E: 
----------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------








Complete the Shape

- Not important what the shape is, you are just looking for patterns again

- The Answer is D because the pattern in each row is big, small, big

A: 	B: 	C: 	D: 	E: 
----------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------



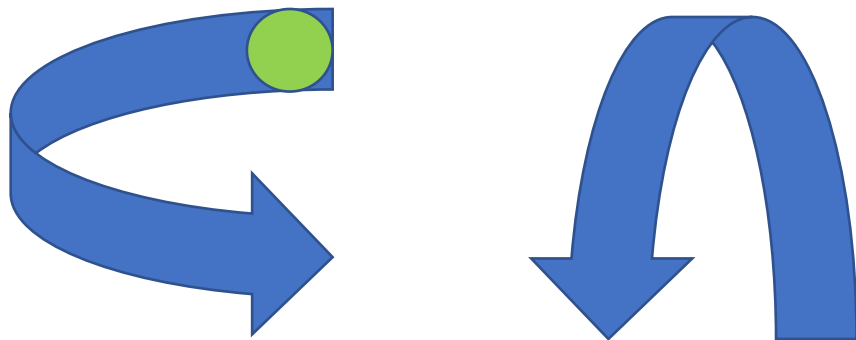
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Analogies / Connections **(as is to as)**



Analogies

- Look at how the first image and the second image are linked, then see if you can find 2 images which are linked in the same way



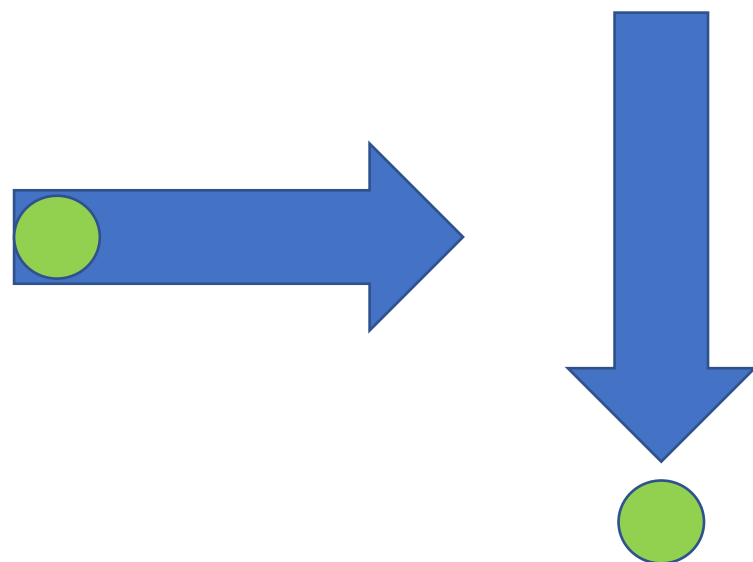
- Image 1 is to Image 2





Analogies

These images have the same relationships even though the shapes are different, the colours are the same and the dot is in the same place on both



Brief Checklist to use to answer many of the questions

- Count:
 - Points
 - Sides
 - Number of shapes
- Look at the direction of:
 - Shading
 - Arrows
 - Any other symbols
- Look at colours and patterns. Can you see anything which relates to each other?
- Look at the thickness of lines
- Look at similarities and differences



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Codes

Codes

- Codes are letters which relate to a part of a picture

- L is the black line




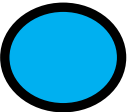

- A is 

- Z is 


- P is 

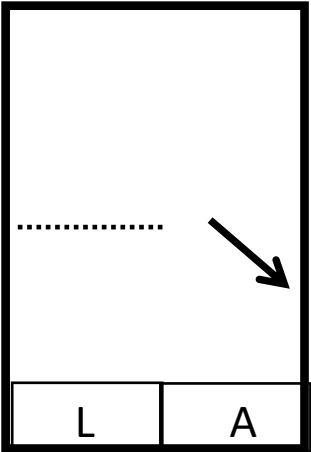
- F is 

Codes

- L is the black line

- A is 
- Z is 
- P is 
- F is 

The Code LA would be

..... for L
 for A



Codes

- L is the black line



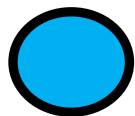
- A is



- Z is



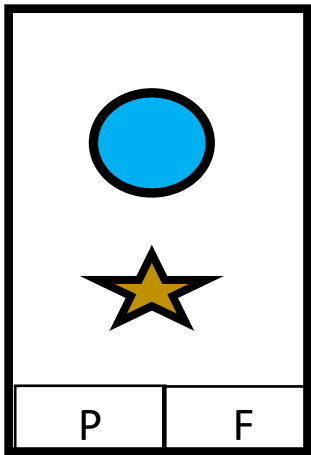
- P is



- F is



The Code PF would be





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Hole Punching Questions



Hole Punch Questions

- Visualise where the fold actually is
- How many layers are in the folded parts

- If you fold is once = 2 holes
- If you fold it twice = 4 holes
- If you fold it three times = 8 holes
- If you fold it four times= 16 holes

Top Tip: Remember the above as long as the punch has gone through all folded sections!



Hole Punch Questions

- How the paper has been folded is important as it means the holes will end up in a different place



Hole Punch Questions



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- If you fold it horizontally

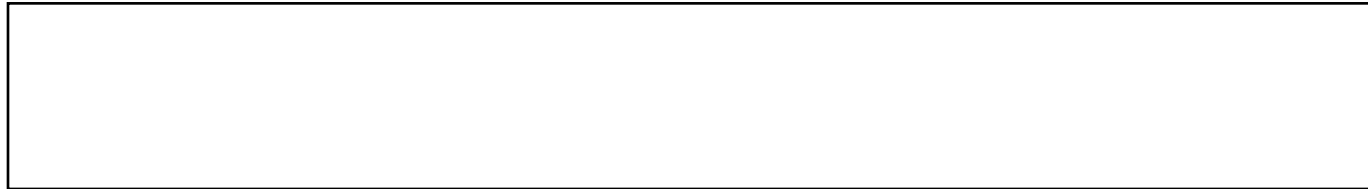
A large rectangular box with a solid black border. Inside the box, there are three horizontal dashed lines, evenly spaced, intended for writing questions. The box is currently empty.

Hole Punch Questions



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- If you fold it horizontally



Hole Punch Questions

- Punch the hole at the end

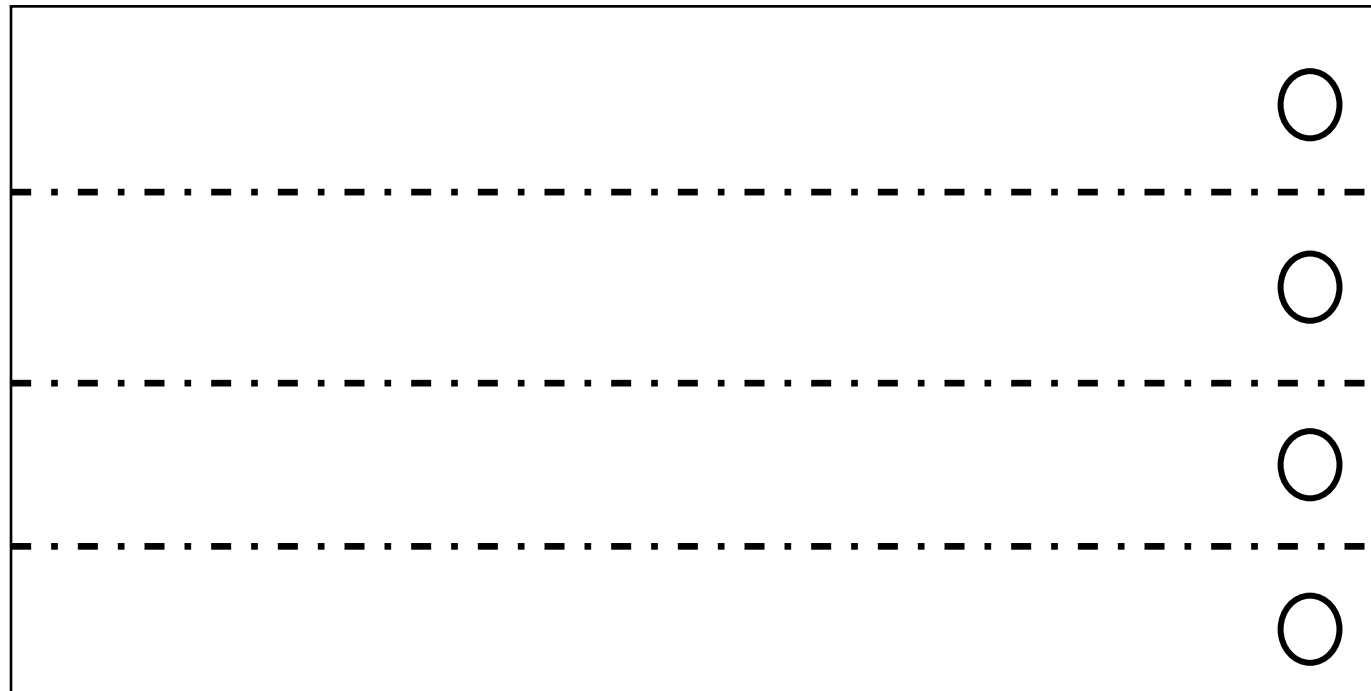


Hole Punch Questions



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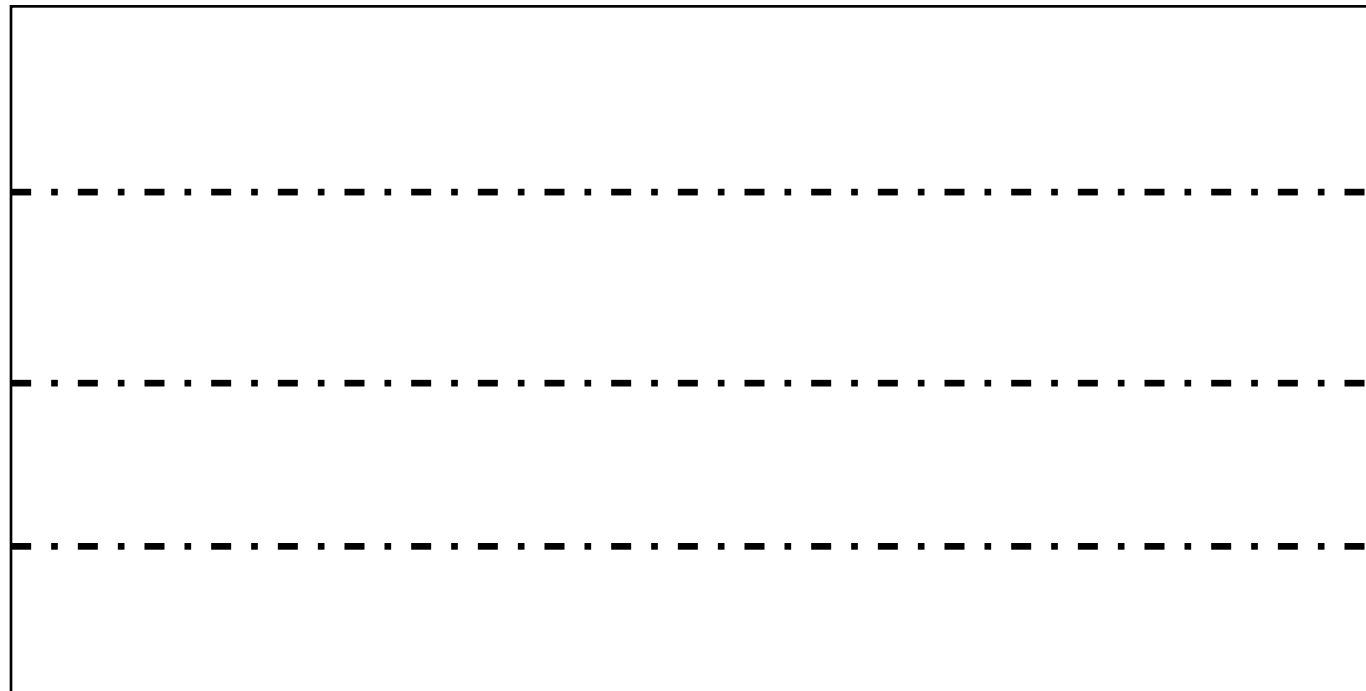
- Open it out, and the holes will be at one end





Hole Punch Questions

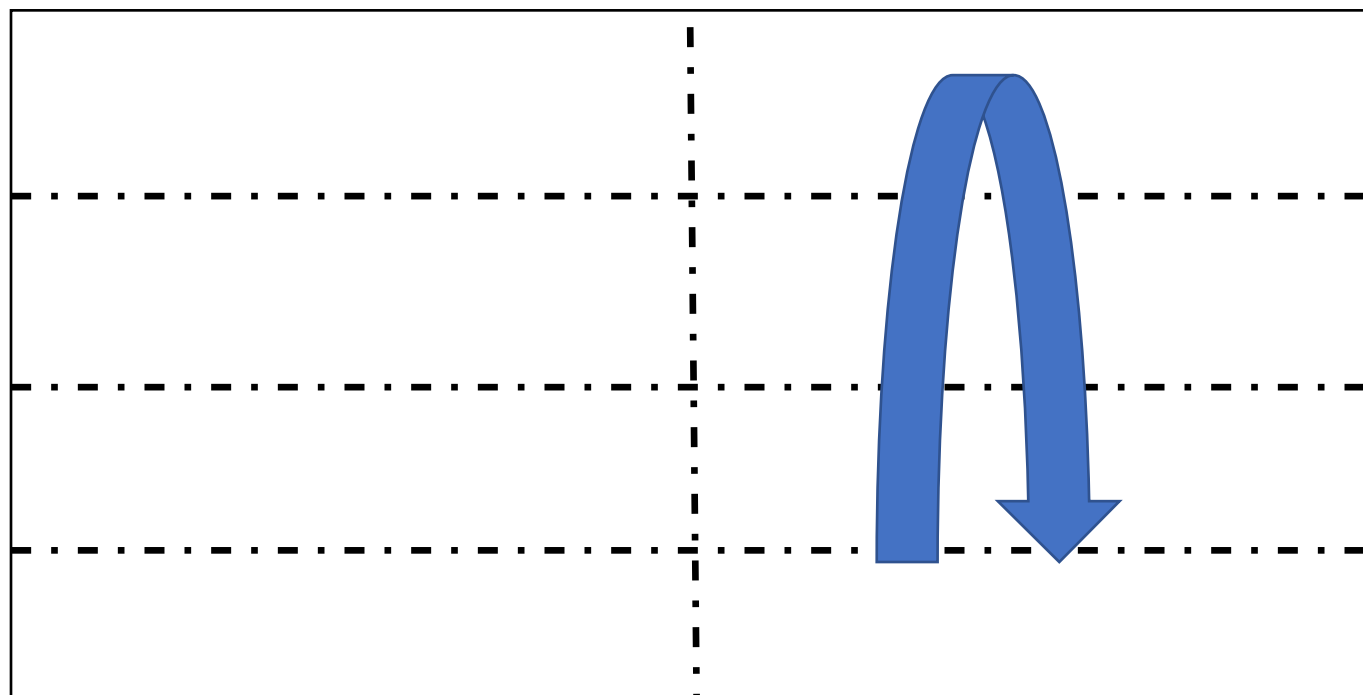
- If you fold it horizontally then vertically the holes will be at both ends





Hole Punch Questions

- Then fold it vertically the holes will be at both ends





Hole Punch Questions

- If you fold it horizontally then vertically the holes will be at both ends



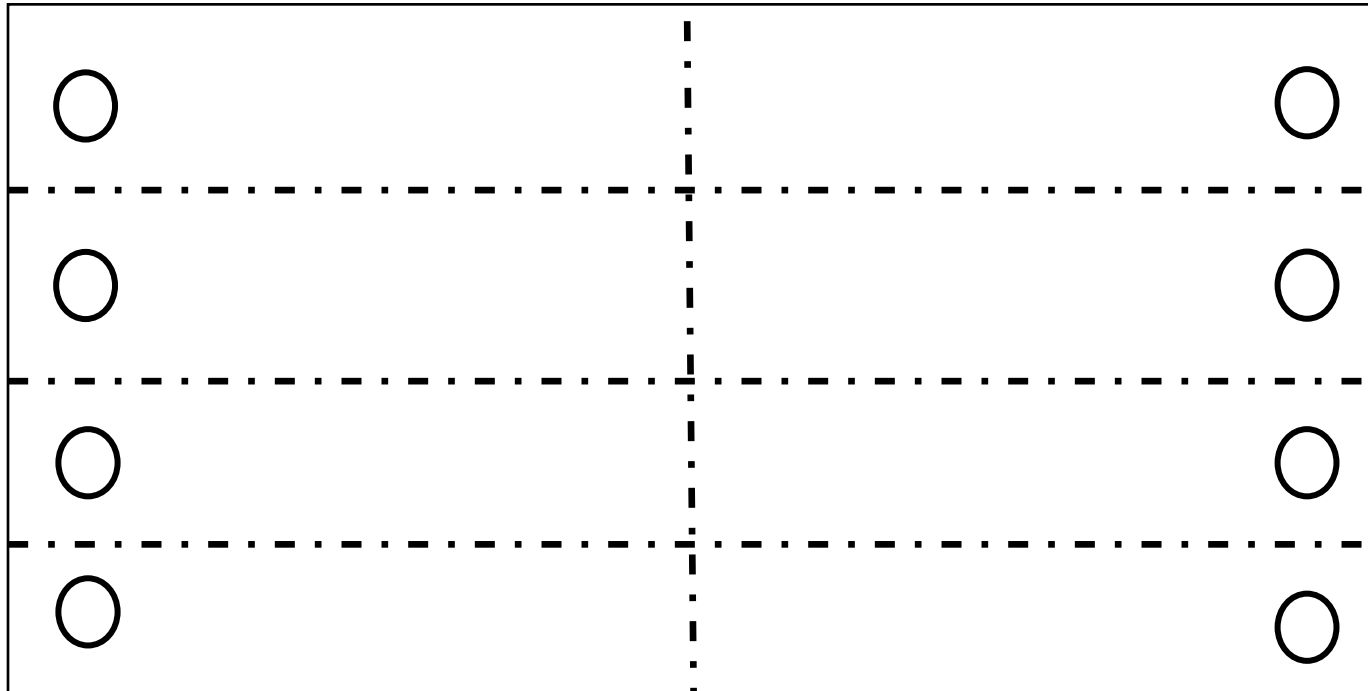
Hole Punch Questions

- Punch a hole



Hole Punch Questions

- Unfold it and the holes will be at both ends

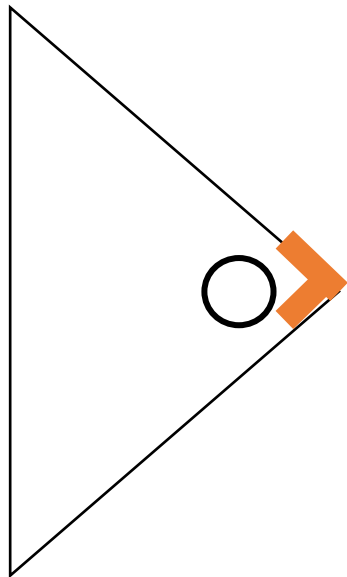




Hole Punch Questions

- If you fold it diagonally and punch a hole at what was the centre of the paper then the holes will be opposite each other

FOLDED



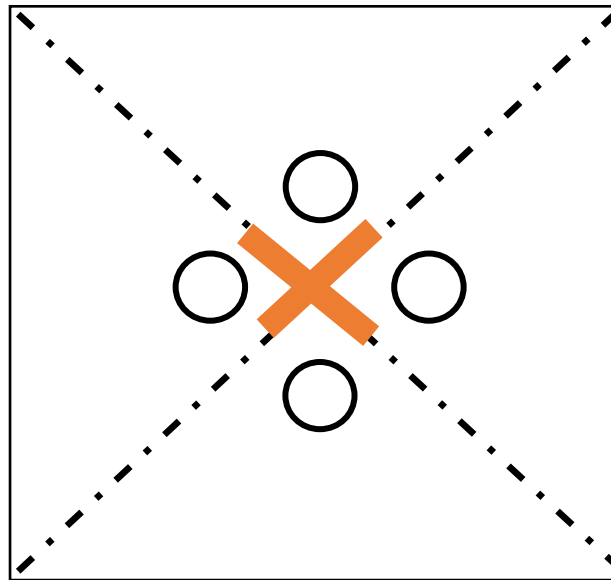
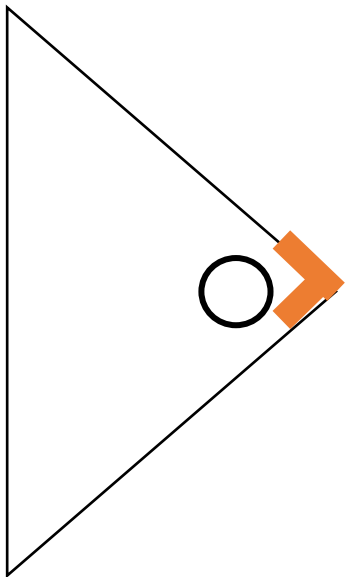
Hole Punch Questions



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FOLDED

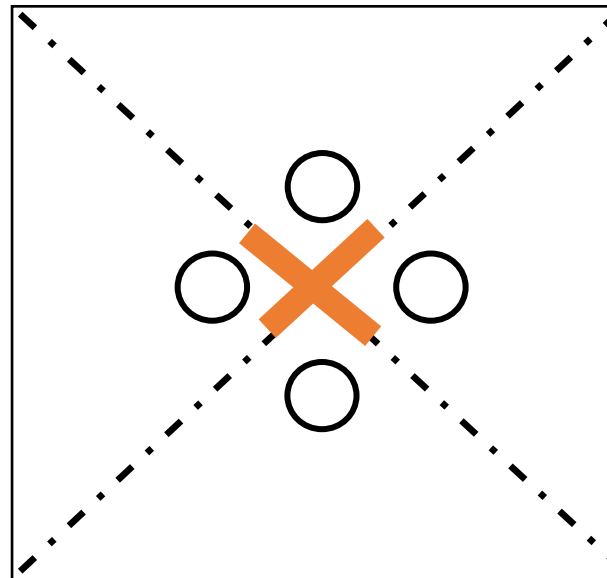
UNFOLDED





Hole Punch Questions

- The holes will be in the centre of the paper (because 1 hole was punched in the centre of the paper)

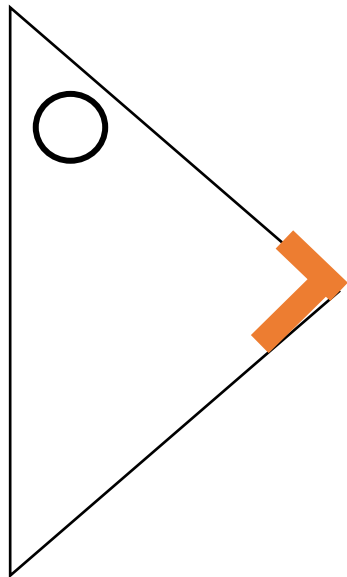




Hole Punch Questions

- If you fold it diagonally and punch a hole in 1 corner

FOLDED

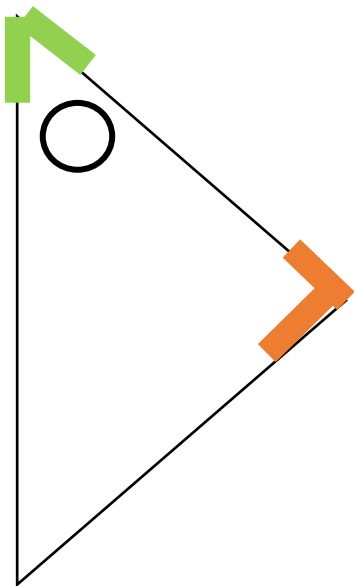




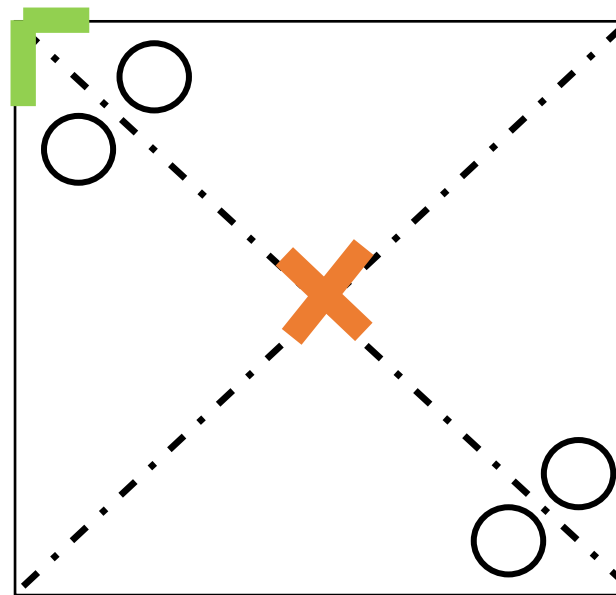
Hole Punch Questions

- Unfold the paper and the holes will be opposite each other- here the hole is on one corner

FOLDED

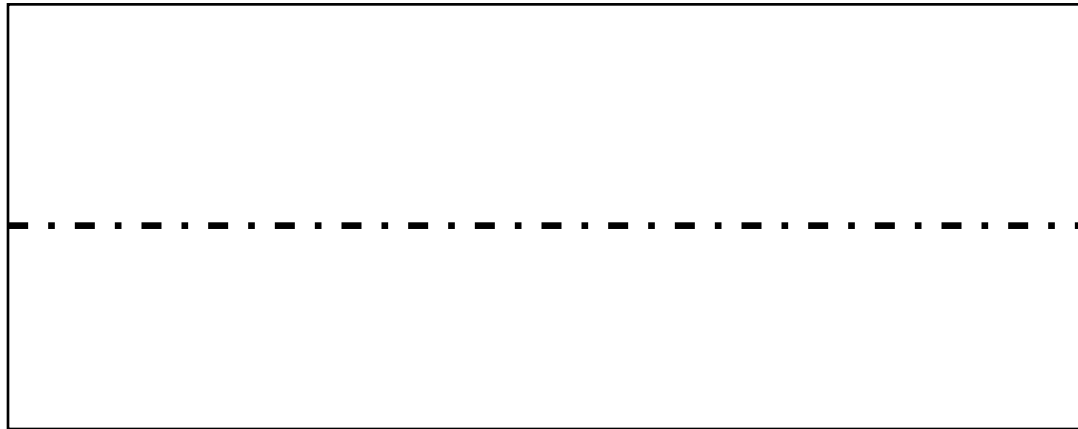


UNFOLDED



Hole Punch Questions

- If you fold it horizontally

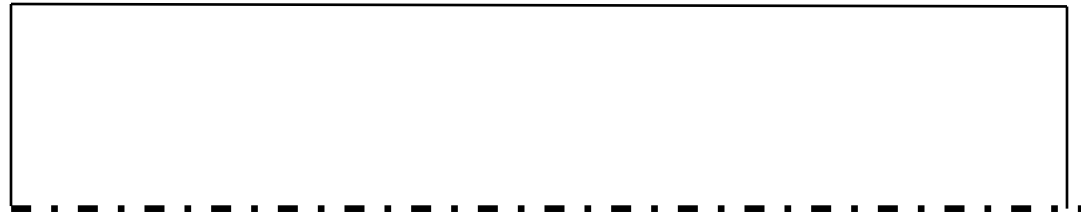


Hole Punch Questions



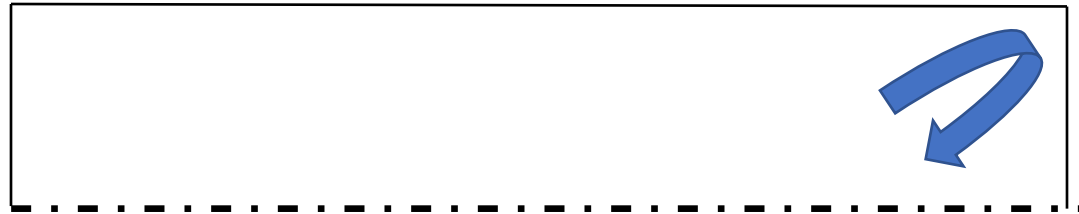
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- If you fold it horizontally



Hole Punch Questions

- Then diagonally in one corner



Hole Punch Questions



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- Then diagonally in one corner



Hole Punch Questions



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- Then punch a hole in the corner



Hole Punch Questions



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- Open it out

