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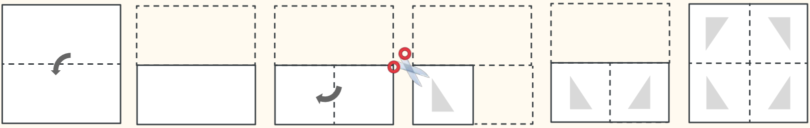
Following Folds

What do you need to know?

In **Following Folds** questions, you will be shown a piece of paper that has been **folded**. You will have to choose the answer option that shows what the paper will look like when it is **unfolded**.



plain paper

square folded in half

square folded in half again

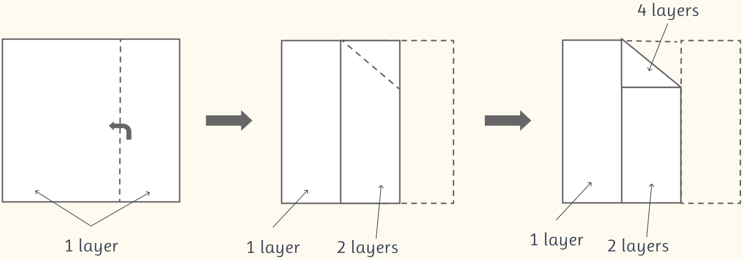
one triangle cut out from the four layers

unfolded once

unfolded completely with **4** cut-out triangles

The **folds** act as **mirror lines**.

If the folds are not directly down the middle of the paper, different parts of the paper can **have a different number of layers**. Make sure you check how many layers each shape is cut out from!



- If you cut out **1 shape** out of **4 layers of paper**, there will be **4 cut-out shapes** when the paper is unfolded.

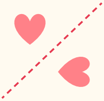
- If you cut **2 shapes** out of **2 layers of paper**, there will be **4 cut-out shapes** when the paper is unfolded.

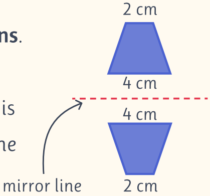
Number of cut-out shapes x number of layers = number of shapes on the unfolded paper

Each **fold** on the piece of paper will act as a **mirror line**. The painted or cut-out shapes will be **reflected across the fold**. You will need to **visualise** these reflections.

Important Vocabulary:

- If you **visualise** something, you picture it in your head. You can try to visualise what a shape will look like when reflected.
- A **mirror line** is a line of reflection.
- **Orientation** is the way a shape is angled. A shape may change orientation when reflected across the fold
- The relative sizes and lengths of a shape make up its **proportions**. Even if a shape is reflected, its proportions will always **stay the same**. In the image to the right the long base of the trapezium is double the length of the short base in the main image and in the reflection.

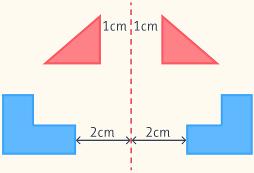




Top Tip!

Pay attention to the distance between the images or shapes and the fold!

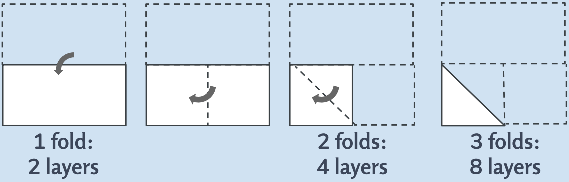
Each reflected shape must be the **same distance away** from the fold as the original shape.



How do we approach these questions?

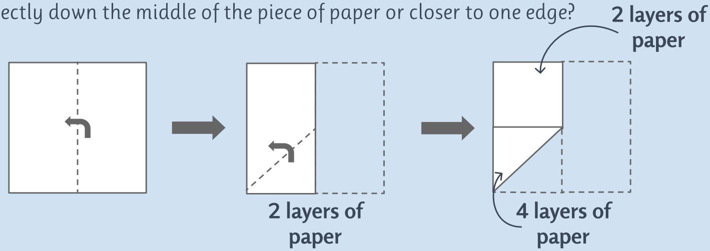
Step 1: Look carefully at the paper in the question.

- How many folds are there in the paper? How many layers of paper does each fold make? Do the folds overlap?



Look at each fold **one by one**.

- Is it **horizontal, vertical** or **diagonal**?
- Is it directly down the middle of the piece of paper or closer to one edge?



Remember - the fold acts as a **mirror line**! Each side of the fold will be the **mirror image** of the other side.

Step 2: Look at the number of **layers** each shape has been cut out from. **Rule out** any answer options that have the **wrong number** of cut-out shapes.

Number of cut-out shapes x number of layers = number of shapes on the unfolded paper

Step 3: Imagine unfolding the paper one fold at a time, starting with the last fold.

Visualise how the cut-out shapes would look when **reflected across the last fold.**

Step 4: Rule out any incorrect answer options:

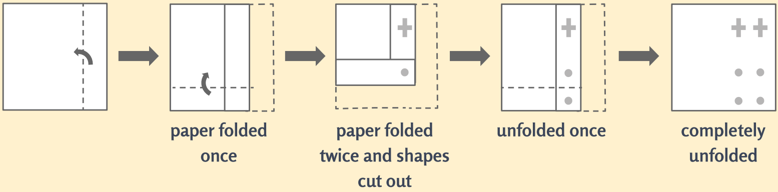
- Has the **wrong type of shape** been cut out?
- Are any of the shapes in the **wrong position** or **orientation**?
- Check that the shapes have not been **rotated** or **copied** across the fold - they must be reflected!

Step 5: Move onto the **next fold** and continue to **rule out** any incorrect answer options. Work backwards until you can visualise what the unfolded piece of paper would look like.

You should be left with **one** answer option that shows the cut-out shapes **reflected across the folds**.

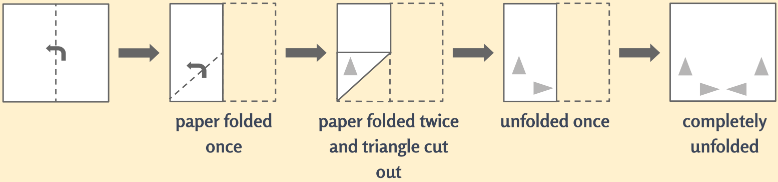
Let's have a look at some examples...

Two folds



1 circle x 4 layers = 4 cut-out circles

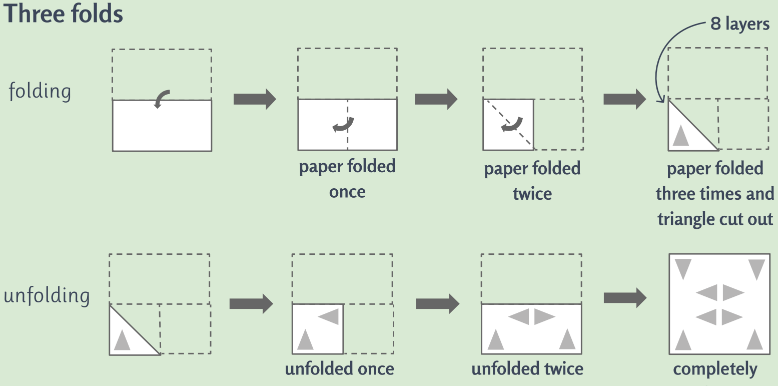
1 cross x 2 layers = 2 cut-out crosses



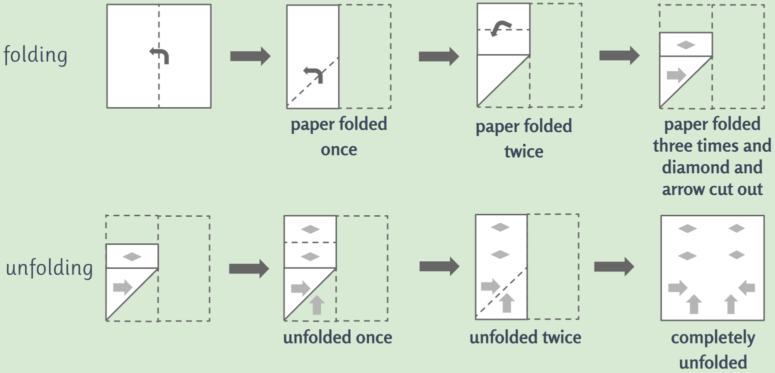
1 triangle x 4 layers = 4 cut-out triangles

Look - the triangles have changed orientation!

Three folds



1 triangle x 8 layers = 8 cut-out triangles



1 arrow x 4 layers = 4 cut-out arrows

1 diamond x 4 layers = 4 cut-out diamonds

Red Herrings!

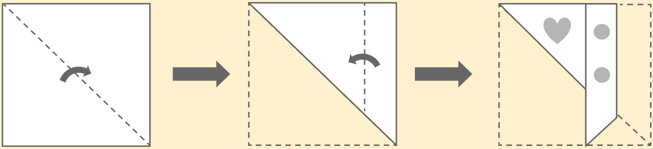
Some of the answer options may be **red herrings** put there to trick you! These red herrings will look **very similar** to the correct answer.

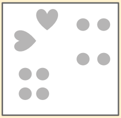
However, the red herrings will have **subtle differences.** For example, there may be one cut-out shape in the **wrong position** or **orientation**.

Look closely at **every cut-out shape** in each answer option - this will help you spot any red herrings!

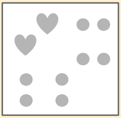
Let's see this in action...

Imagine that this piece of paper has been folded twice and then had shapes cut out of it. Which of the options shows how the paper will look once it has been unfolded?

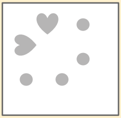




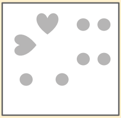
A



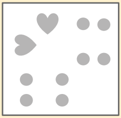
B



C



D



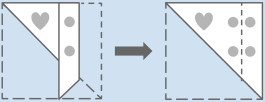
E

Let's start by looking at how many layers of paper each shape has been cut out from:

- The heart has been cut out from 2 layers so the answer will contain **2 hearts**.
- The 2 circles have been cut out from 4 layers so the answer will contain **8 circles**.
- We can **rule out** options C and D: they have the **wrong number** of cut-out circles!

Now let's visualise how these cut-out shapes would be positioned...

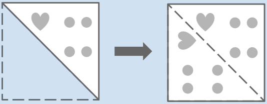
- When we unfold the **last** fold, the 2 circles will be reflected across the vertical fold.
- This doesn't help us rule out any of the answer options.



unfolding the last fold

Let's move onto the **first** fold...

- The heart and the 4 circles will be reflected across the diagonal fold.

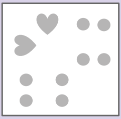


unfolding the first fold

- The left-hand heart in option B is **not** in the **correct orientation**: it is a **copy** of the other heart, rather than a reflection of it across the fold. The bottom of the heart should be pointing towards where the diagonal fold was.
- In option A, the circles in the bottom-left corner are in the **wrong position**: they are not spaced the same way as the circles in the top-right corner.

Answer:

- The right answer is **option E!**

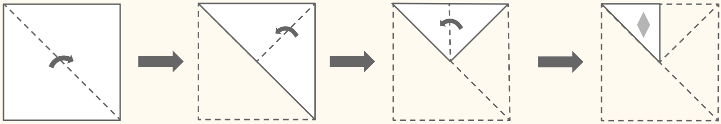


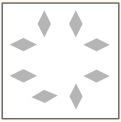
E

✓

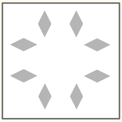
How about this one?

Imagine that this piece of paper has been folded and then had shapes cut out of it. What will the paper look like once it has been unfolded?

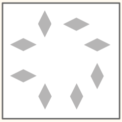




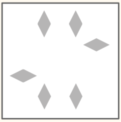
A



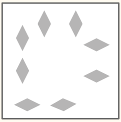
B



C



D



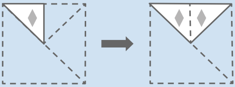
E

Let's start by looking at how many layers of paper there are...

- The diamond has been cut out from 8 layers so the answer will contain **8 diamonds.**
- We can rule out option D: it has the **wrong number** of cut-out diamonds!

Let's start by unfolding the **last** fold...

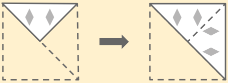
- When we unfold the last fold, the diamond will be reflected across the vertical fold.
- We can rule out option C as the diamond has been **rotated** rather than reflected across the last fold.



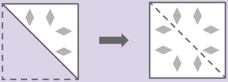
unfolding the last fold

Now let's move onto the **next** fold...

- When we unfold the second fold, the 2 diamonds will be reflected across the diagonal fold.



unfolding the next fold



What happens when we unfold the **first** fold?

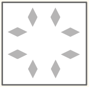
- The 4 diamonds will be reflected across the diagonal fold.

-- The diamonds in option E are in the wrong orientation: we can rule it out.

- We are left with options A and B which look very similar.
    - Can we see any differences between the two options?
    - The bottom-left diamond in option A is in the **wrong orientation**.
    - We can rule out option A - it is a **red herring**!

Answer:

- **Option B** is the right answer! ✓



Top tips!

- The shapes will be **reflected across the folds**: each fold will act as a **mirror line**!
- If you think you've found the right answer, **visualise** folding the paper across each fold. Would the shapes on either side of the fold line up perfectly?
- Questions with multiple folds can be tricky! Make sure you look at each fold **one by one**, starting with the last fold.