Exploring multiple reflections – 1

(Ireland)

You will need:

- ✓ two mirrors
- ✓ adhesive tape
- ✓ some large printed text

Follow these steps:

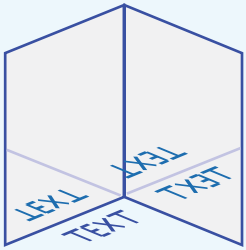
1. Place one mirror flat on the table, reflective side up.
2. Place the second mirror on top of the first, reflective side down.
3. Tape the mirrors together along one edge only so that they form a flexible hinge.
4. Set the mirrors standing at right angles to one another, with the hinge vertical.
5. Place some text in front of one of the mirrors.

So what happened?

Three images of the text appear in the mirrors. (If not, then check that the angle between the mirrors is 90°.)

Note that the text is reflected vertically in one mirror and reflected horizontally (i.e. laterally) in the other. In each case some letters look the same as the original.

These two reflections are (theoretically) superimposable; they just have different orientations. One can be considered a '**rotation**' of the other.

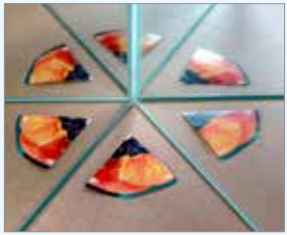


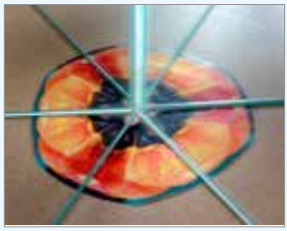
The text reflected in both mirrors looks like the original text. It has been reflected twice and ends up as a '**rotation**' of the original through 180°.

Other angles

6. Change the angle of the mirrors and note the changing number of reflections. What is the relationship between the number of images (including the original) and the angle? *

7. Note that text is **reversed and rotated** by an **odd number** of reflections. Text is **rotated** by an **even number** of reflections but is **not reversed**.
8. Place other objects between the mirrors and note the reflections.





What next?

Set the angle of the mirrors at exactly 90°. Look at your own reflection in the pair of mirrors. What do you notice?

* The **number of images** (including the original) is equal to 360° ÷ (angle between the mirrors). Check this out.