

Answer on Question #53098, Physics / Optics

Why is there right-left inversion when we look into a mirror?

Answer:

This inversion is apparent only because of our perception. We use a different frame of reference to arrive at conclusions. It's because we're interpreting a **reflection** as a **rotation**.

A mirror does not reverse images left-to-right, but from **front-to-back**. In other words, your mirror image hasn't been swapped, but inverted along a third dimension, like a glove being turned inside out.

Lets say you have the letters "AW" written on a transparent paper. Hold the paper between you and the plane mirror pointing the letters at the mirror. What you see on the mirror is "WA" and we say the image is right-left inverted. This is because the writing on the paper appears as "AW" from the perspective of a person who is standing between the paper and the mirror.

But if the person stands behind the paper and reads it, what shows up is "WA", which is exactly what is in the mirror.

So, if you shift your frame of reference to behind the object, the image in a plane mirror is exact in all respects. **The plane mirror always produces a virtual image per the laws of reflection** (i.e, the image is formed behind the mirror) and virtual images are always upright.