Investigating the relationship between real and apparent depth essay sample

In this coursework I am going to measure the real and apparent distance of an optical pin placed behind glass blocks. To do this I got two glass blocks and stuck a pin at the end of one of the glass blocks and then placed a drawing pin on to the glass blocks and then moved the drawing pin around to get the apparent depth and the real depth was the length from the pin to the end of the glass blocks. I made a diagram to clearly show how the apparatus was assembled. The apparatus and the way in which I conducted the experiment looks like the diagram below.

Method

To make the experiment successful I made sure the safety factors were taken into account, the experiment was very safe as there was no real danger that could be inflicted on anyone during the experiment, to make sure the experiment was safe I took care of the pins, I kept the pins on the wooden board or attached to the glass blocks. I could have worn some gloves but I thought that this would not be necessary as there was no real danger.

I am going to measure the real and apparent distance of an optical pin placed behind glass blocks. To measure the apparent depth I will attach an optical pin to a glass block then I will place a drawing pin on top of the glass block, to determine the apparent depth I simply found the place where the drawing pin lined up with the optical pin even when I moved my head form side to side. The real depth was the distance from the optical pin to the drawing pin. This experiment was repeated using different lengths and using different sides of the glass blocks. I did each experiment twice so that my

results were reliable, to do this I simply took one reading then I picked the pin up and placed it back down again to take a second reading. If the values of the readings weren't close to being the same I then repeated the experiment until I got satisfactory results that I could use to determine the relationship with real and apparent depth.

Prediction

By looking at all the information, I predict that an object that is placed behind a material that is denser that the material from which the observer looks, then the object will look like it is closer.

Obtaining Evidence

By reading information about the topic in this coursework I have discovered what causes the effect of real and apparent distances to objects. Light travels at 3×108 m/s in a vacuum, it travels slightly slower in air and even slower through glass or water. The change of speed from when light enters a transparent material from air is called refraction. When light is travelling into a transparent material at 90o then the light will pass straight through with no direction change this is because the light travels fast in air then slower in glass and then continues to travel quickly through air again and so it looks like it hasn't changed direction.

If a light ray approaches a glass block at an angle to the normal, its direction changes on entering and leaving the glass block. This is because the light ray slows down in glass and the image that is seen through it appears closer. The value how much closer it appears from the real distance is related to the

refractive index which is a measure of how much the speed of light is changed, it is defined for each material. This is calculated by the speed of light in air divided byt the speed of light in the substance and is called refractive index.

As I did the experiment continuously until I got the readings that were reliable then I cant say that the results weren’t reliable, and so I can only come up with one possible way to make the experiment better and more reliable. As I used my eyesight to do this the one error I can come up with is human error, because I used my eyesight then this could have altered my results, to make this better I could have used a lazer beam as this would have made my results much more accurate. Also I could have used a ruler that was more precise to make my readings even better. My prediction was proved right, to sum up my experiment I would say it was successful as I managed to gather some good results that proved my prediction.