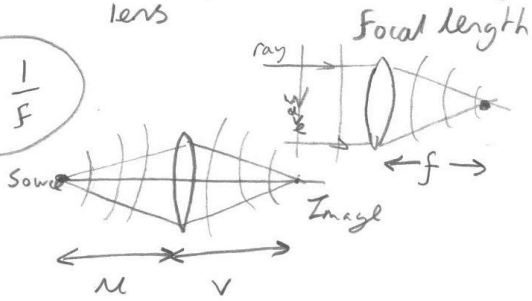
1.3 With your own eyes

Refractive index = Speed in vacuum / Speed in material

$n = 1.5$ speed = material $\frac{3.6 \times 10^8}{1.5} = 2 \times 10^8 \, ms^{-1}$

Curvature of waves going out = Curvature of Waves coming in + Curvature added by lens

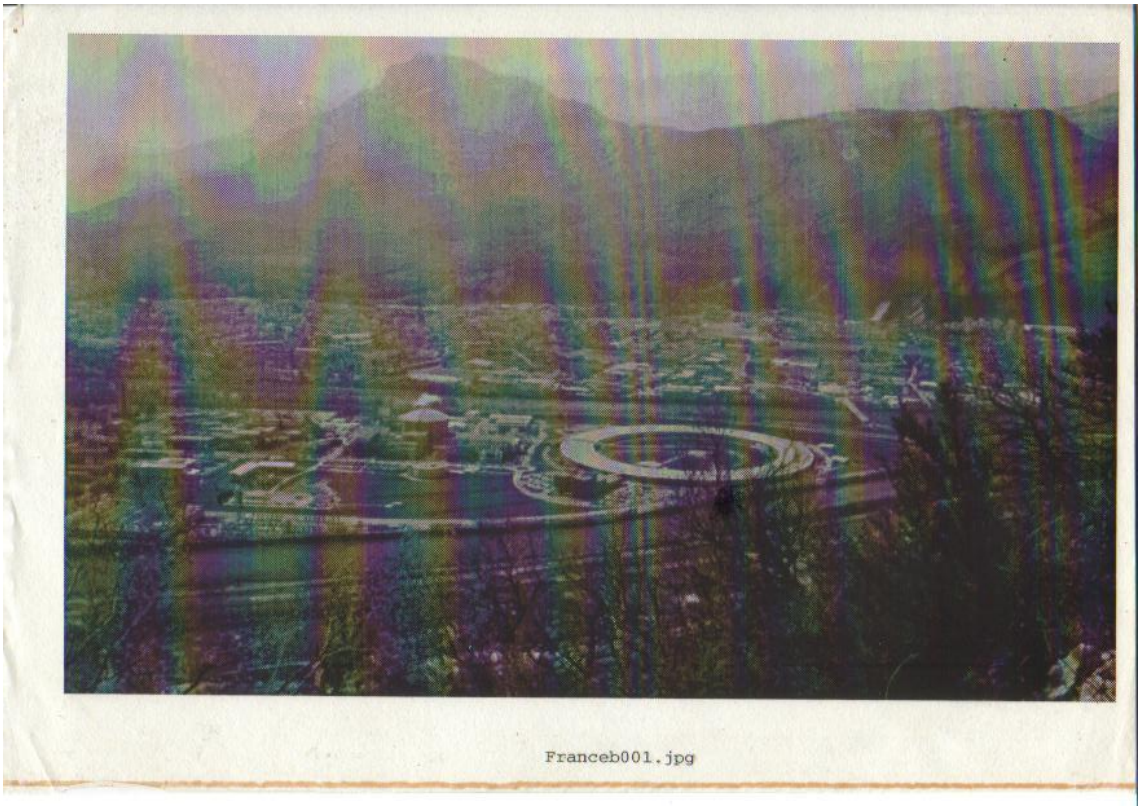
$$\frac{1}{v} = \frac{1}{u} + \frac{1}{F}$$



Light takes the same time to travel all paths.

More glass in centre of convex lens so slower through here.

Power of Lens = $\frac{1}{F}$ dioptre



	Basic explanation	Correction	Optical detail
SHORT SIGHT	• Can't see distant objects • Far point closer • Eyeball too long • Lens too strong • Cornea too curved	(contact) concave /diverging Lens Laser correction changes the curvature of the cornea	• Image is in front of retina • image forms on retina after correction • so image forms on retina
LONG SIGHT	• Can't see near objects • Near point further away • Eyeball too short • Lens too weak • Cornea too flat	(contact) convex / converging Lens Laser correction changes the curvature of the cornea	• image is beyond the retina • image forms on retina after correction • so image forms on retina

1.2 Information on images

Pixel ■

- Image enhancement
- Averaging

Logarithmic (Choice of 2)

1 bit = 0, 1

1 byte = 8 bits

$2^8 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 256$

Number of choices 0, 1 Base 2

So 1 pixel of grey scale has 256 alternatives and needs 8 bits to store it

The 'I' in this context is called the "plus" scale and is linear
1, 2, 3, 4, 5, 6

The number of alternatives is called the 'times' scale and is logarithmic
2, 4, 8, 16, 32, 64, 128

Number of alternatives $N = 2^I$ for I bits

Number of bits increase by 1 then the number of alternatives doubles