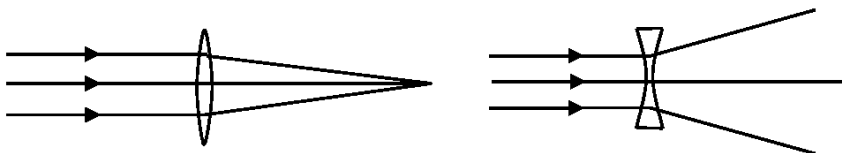


Student 5: Low Achieved  
 NZQA Intended for teacher use only

There are two types of lenses convex and concave. Convex lenses are lenses that curve outwards, they converge parallel light rays to a focal point. Concave lenses are thinner in the middle and thicker at their edges. Concave lenses diverge parallel light rays away from each other.

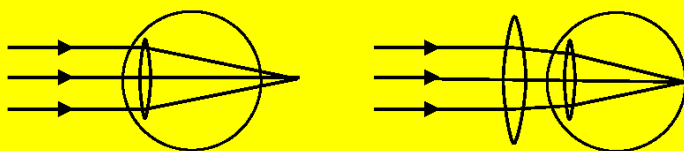


Lenses are able to correct short sightedness because short sightedness is when the light that comes to the convex lens in your eyes converges (meets) at a focal point before your retina. (You can only see an image when the light ray's focal point falls on the retina).



So when you wear glasses they put a concave lens in them which diverges the light rays before they meet the lens in your eye so that when they do converge after going through your lens they converge to a point on your retina and the image is no longer blurry and you can see.

Long sightedness is when the lens converges the light rays but they don't meet on your retina. Instead, if they could, they would come to a point after the retina. And so they use a convex lens to converge the light rays before they reach your eye so then when your eye's lens converges them again the focal point is reached on the retina.



1

It is necessary to pump fluid in and out of the lens to change their shape between concave and convex to become the type of lens that the person needs to be able to see. So for example if they were short sighted the liquid would be pumped out to create a concave lens to help them see.

Silicone was used instead of other substances like water because it is more dense and so it has a higher refractive index. Water has a refractive index of 1.33 whereas silicone is 1.406. This means that the lens doesn't have to be so thick to converge/diverge the light rays to the right extent needed for the person to see [3]. If they used water to fill the lenses they would become thicker and the glasses and flexible membrane would have to be bigger to cater for the larger lens.

2