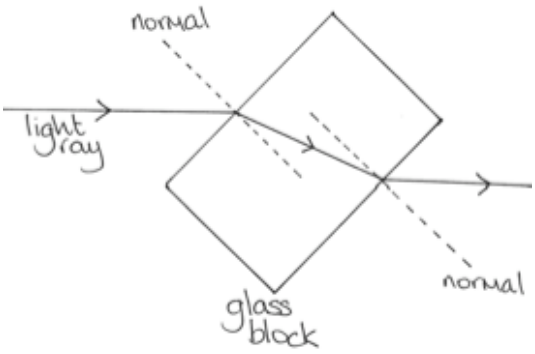
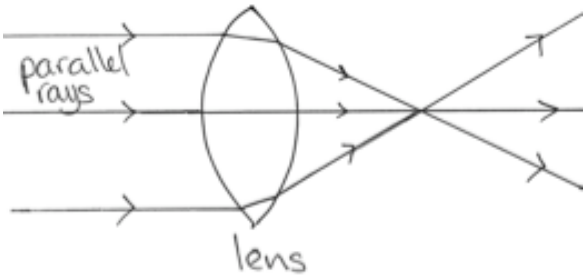
Health Physics
HW exercise 3 – Light & Sight

1.

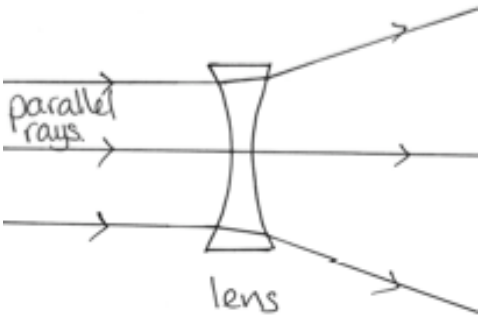
(a)



(b)



(c)



(d) The lens in part (b) is a **convex** lens.
The lens in part (c) is a **concave** lens.

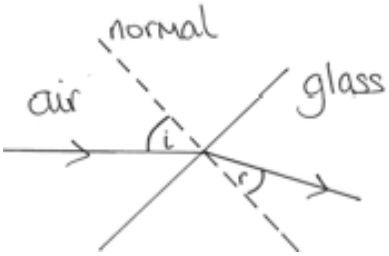
2. Refraction is the bending of light as it travels from one material into another.

3.

Type of sight:	Description:	Type of lens used to correct:
Short	Can only see close objects clearly	concave
Long	Can only see far away objects clearly	convex

4. Fibre optics are used in a fibrescope to provide a way to see inside a patient's body. The optical fibres are flexible and can bend around areas such as the throat to examine the oesophagus or around the bowel. One of the fibres in the fibrescope carries light down into the body. This provides a cool light source, since no heat from the filament bulb travels down the fibre, and so prevents burning of the patient's internal tissue. Other fibres within the fibrescope carry reflected light back up to the consultant, allowing him to see the area around the tip of the scope.

5.



i = angle of incidence, r = angle of refraction

6.

(a) $P = \frac{1}{f} = \frac{1}{0.0588} = 17D$ ← lens power is measured in Dioptres

← convert f from cm into m

(b) $P = \frac{1}{f}$

$-10D = \frac{1}{f}$

$f = \frac{1}{-10} = -0.1m$