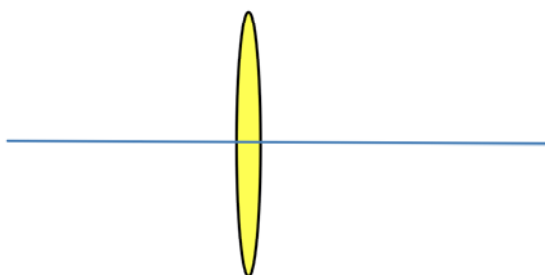


**Mark scheme for Support Worksheet – Option G,  
Worksheet 1**

- 1 An electromagnetic wave is a pair of oscillating electric and magnetic fields at right angles to each other; and at right angles to the direction of energy transfer of the wave. [2]
- 2 X-rays, blue light, infrared radiation, radio waves. [1]
- 3 It is true, this is one of the defining properties of EM waves. [1]
- 4 This is not true, the speed of EM waves in glass depends on the wavelength, i.e. on the type of EM wave. [1]
- 5 Dispersion is the phenomenon in which the speed of a wave depends on the wavelength of the wave. [1]
- 6 Light from a laser is coherent that from a filament lamp is not; (What this means is that a cross-section of the laser beam consists of points in phase.) [1]

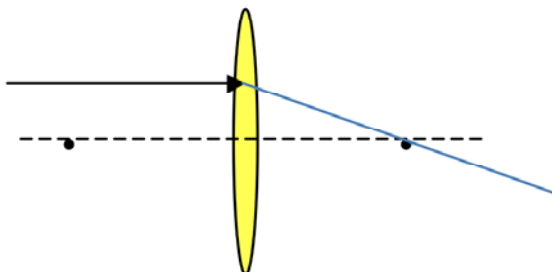
7



[1]

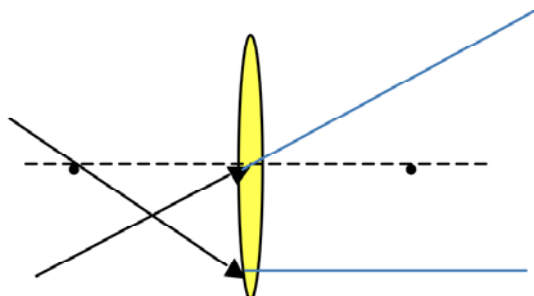
- 8 a The focal point of a converging lens is that point on the principal axis of the lens where a ray parallel to the principal axis will pass through after refraction from the lens. [1]

b



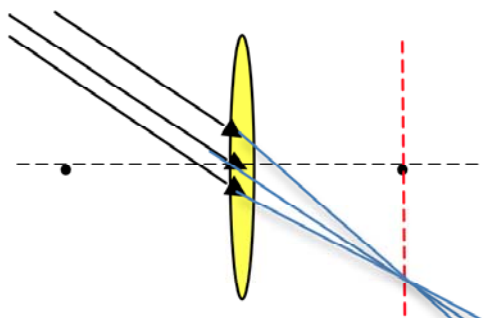
[1]

9 See diagram.



[2]

10 See diagram.

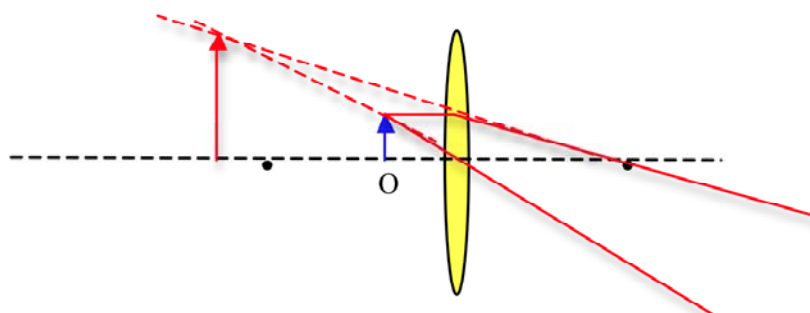


[2]

11 Actual rays of light pass through a real image; only mathematical extensions of rays pass through a virtual image.

[2]

12 See diagram.



[3]

13 Because different wavelengths of light have different refractive indices; rays of different wavelengths (i.e. colours) will have slightly different focal points; therefore an image will have coloured edges.

[3]

14 Because rays parallel to the principal axis but far from it have a slightly different focal point from rays parallel to the principal axis and close to it; an image will be blurred and curved at the edges.

[2]