

Refraction by Lenses

Chapter 9: Light – Reflection and Refraction · Topic 2

Key Concept

The power of a lens ($P = 1/f$, with f in metres) is measured in dioptres (D), indicating how strongly the lens converges or diverges light — a convex lens has positive power, a concave lens has negative power. A combination of lenses, as used in a camera, microscope, or telescope, allows for image manipulation beyond what a single lens can achieve, such as achieving high magnification while correcting for certain optical distortions.

Quick Revision Notes

- Convex lens: converges light, forms real or virtual images. Concave lens: diverges light, always virtual, diminished image.
- Lens formula: $1/v - 1/u = 1/f$.
- Lens power ($P = 1/f$ in metres) is measured in dioptres; convex is positive, concave is negative.
- Combinations of lenses are used in cameras, microscopes, and telescopes.

Practice Questions

- 1 Calculate the power of a lens with focal length 0.5m.
- 2 Explain the difference between the image formed by a convex lens and a concave lens.
- 3 Why might a camera or telescope use a combination of lenses rather than a single lens?