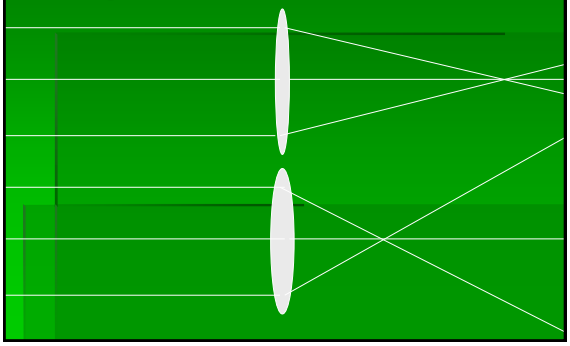
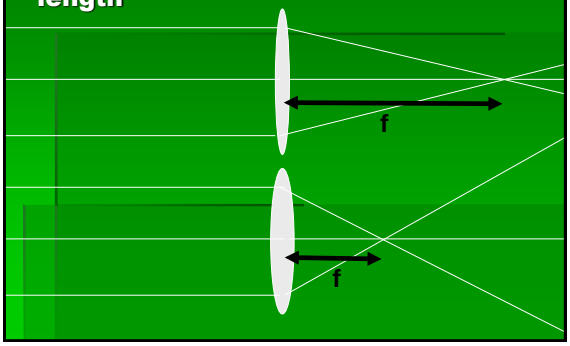
Power of a Lens

How does an optician identify different lenses?

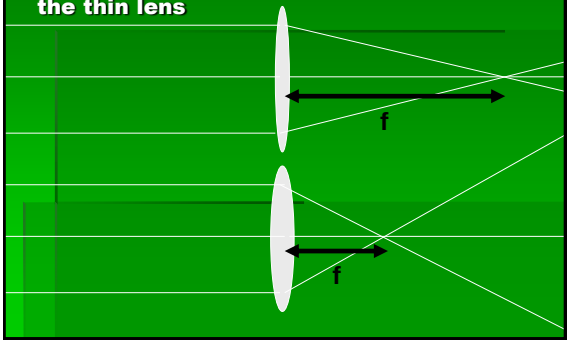
Compare these 2 convex lenses:



The thicker lens has a shorter focal length



The thicker lens "bends" the light more, so we say it has a greater POWER than the thin lens



Power of a Lens

- A more powerful lens causes more refraction.
- The power of a lens is measured in **dioptres**.

$$power = \frac{1}{focal\ length}$$

$$focal\_length = \frac{1}{power}$$

What does this mean?

- A 2 Dioptre lens focuses at 0.5 metres (1/2m)
- A 3 Dioptre lens focuses at 0.33 metres (1/3m)
- A 5 Dioptre lens focuses at 0.2 metres (1/5m)
- A 10 Dioptre lens focuses at 0.1 metres (1/10m)
- A 2 Dioptre lens focuses at 0.5 metres (1/2m)

POWER OF A LENS

To calculate a lens' power, use this equation:

$$power = \frac{1}{focal\ length}$$

For short:

$$P = \frac{1}{f}$$

Dioptres (D)

Metres (m)

Power of Lenses

- Converging lenses have a positive focal length and a positive power.
- Diverging lenses have a negative focal length and a negative power.

Summary

Type of lens	What it does	Focal length	Power
Convex	CONVERGES light (*brings the rays together*)	Positive	Positive
Concave	DIVERGES light (*spreads the rays*)	Negative	Negative