SAWA UNIVERSITY

LECTURE TITLE

جامعة ساوة

كلية التقنيات الصحية والطبية

قسم تقنيات البصريات

الثالة المرحلة

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LENSES

A lens is defined as an optical medium bounded by Two polished surfaces that form a part of a sphere (spherical lens) or a cylinder(cylindrical lens).

USES

1-Correction of refractive errors 2-Protection against harmful rays of electromagnetic Spectrum 3-Protection against external bodies

SPHERICAL LENSES

Spherical lenses correct refractive errors unaccompanied by Astigmatism. A spherical lens is defined as a lens in which Each surface forms a part of the surface of a sphere. However, A plane surface may be considered as part of a spherical Surface of infinite radius. Power of
spherical lens is expressed In diopter spherical (DSPH).

Types of spherical lenses

• A-Convex or Plus Lens

Convex lenses are worn by patients who are hypermetropic, i.e\farsighted The image of an object falls behind the retina in hyper- metropic people and convex lens converges parallel rays of light to bring the image forward on the retina.

Concave or Minus Lens

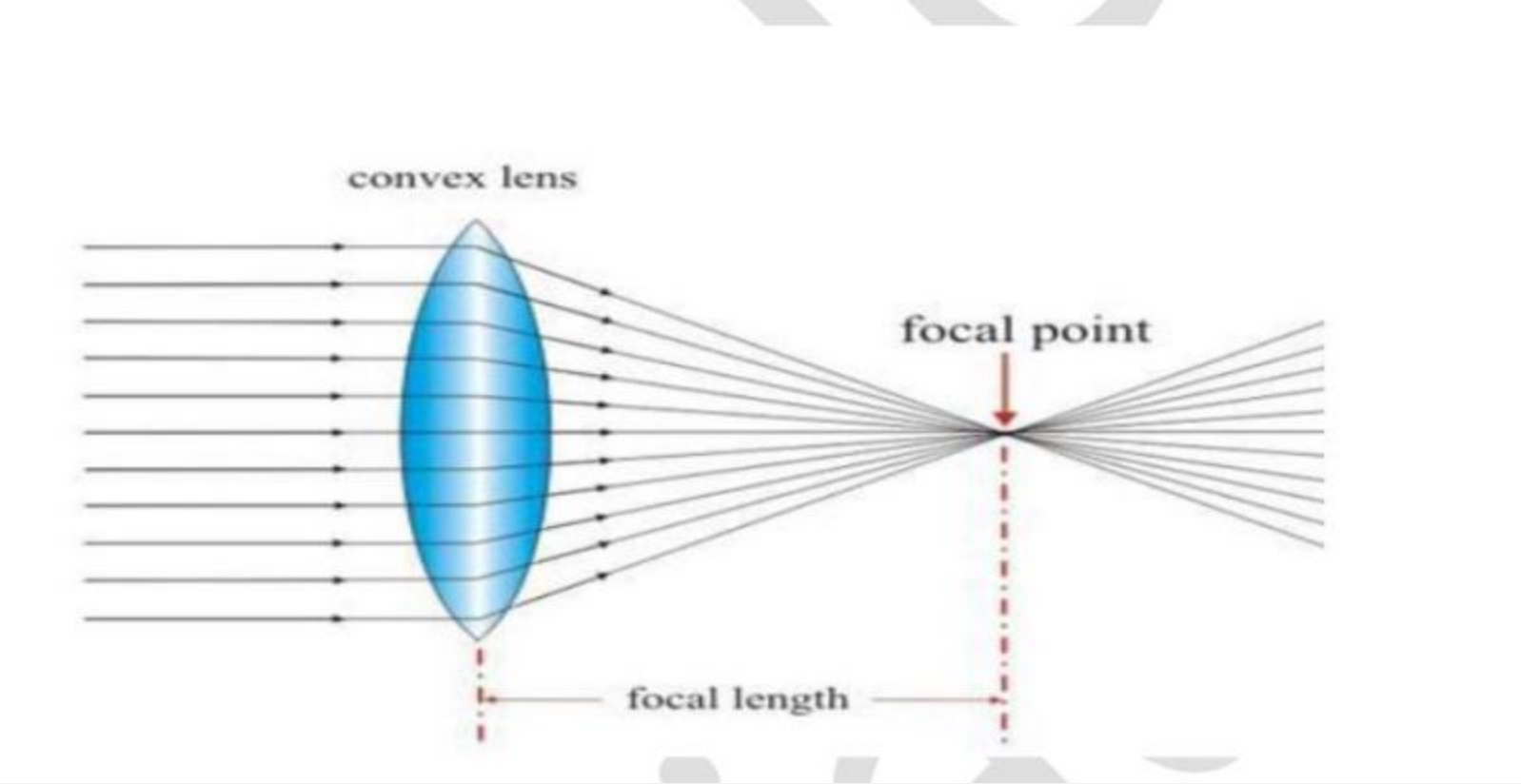
Concave lenses are worn by patients who are myopic, 1e Nearsighted. In myopia, the image of an object falls in front Of the retina and concave lens diverges the parallel Rays of light to shift the image behind, on the retina.

How to identify convex lens?

1-It magnifies images, i.e. makes them larger

2-When the lens is moved in front of the eye, the object Moves in the opposite direction. This is called against Movement. 3-The lens is thicker in the middle and thinner on the Edges.

4-The greater the vertex distance (further away from the Eye), the stronger the power, i.e. magnification of the lens.



Uses of convex lens

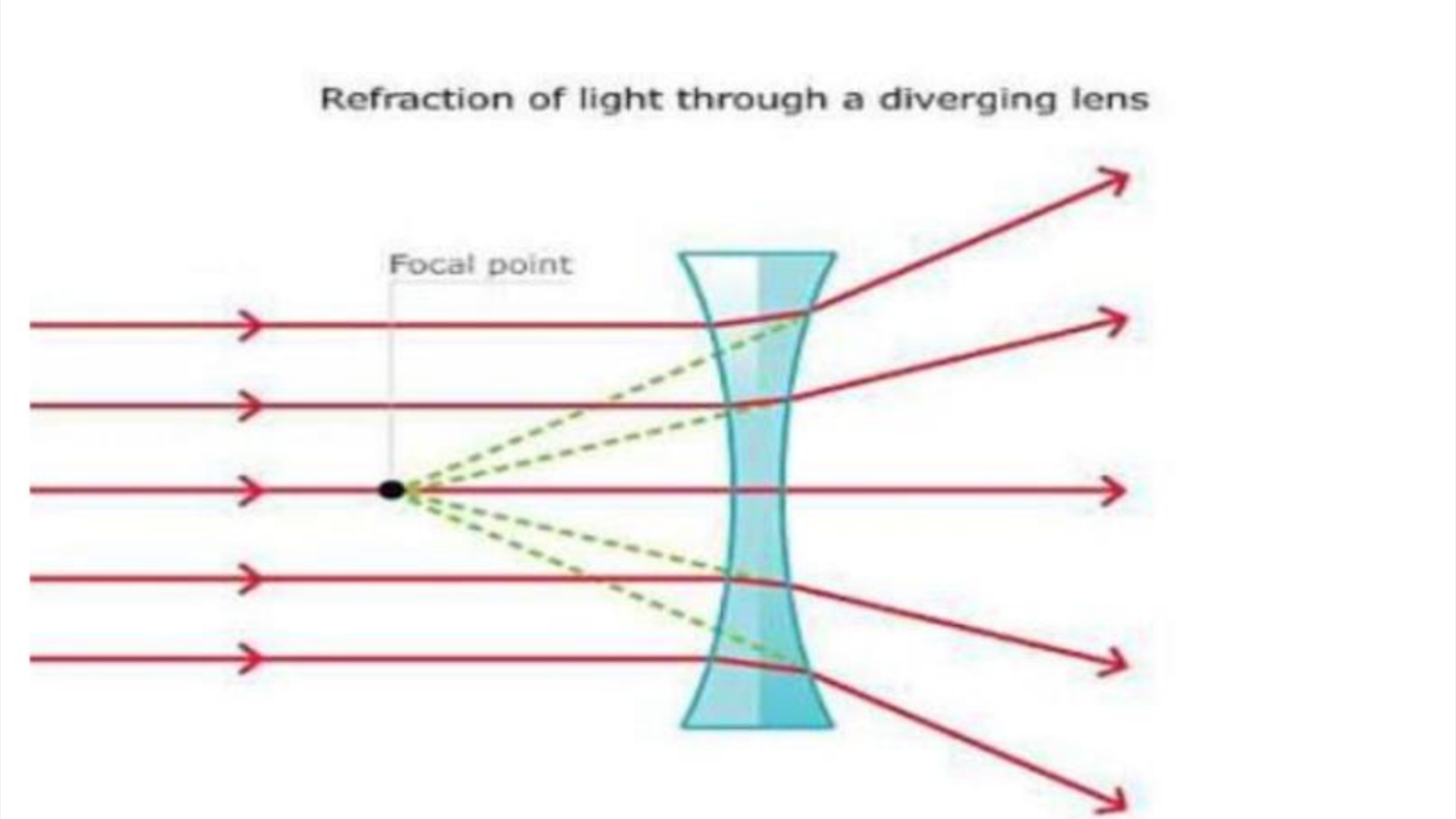
1-correcation hypermetropia. 2-presbyopia.

3- Aphakia.

4- In low visual aids as magnifier.

Concave lens
Diverging.
Biconcave, plano-concave and convexoConcave
Thin in the center.
An object seen through it appear minified • It used for correction of myopia.

How to identify concave lens?
1-It minifies images, ie. Makes them smaller.
2-When the lens is moved in front of the eye, the Objects move in the same direction This is called with Movement
3-The lens is thinner in the middle and thicker on the Edges.


Refraction of light through a diverging lens
Focal point

2. **Cylindrical lens**: acts only in one axis. Cylindrical lens The edges are not equal.
Uses of cylindrical lenses for correction of astigmatism.
There are three types of cylindrical lenses