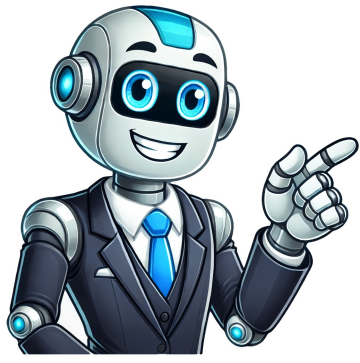


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Made with lots of love and caffeine 2025, Teachoo. All rights reserved. Last updated at Dec. 16, 2024 by Teachoo We saw that, image formed by convex lens is Position of the object Position of the image Relative size of the image Nature of the image At infinity At focus F 2 Highly diminished, point-sized Real and inverted Beyond 2F 1 Between F 2 and 2F 2 Diminished Real and inverted At 2F 1 At 2F 2 Same Size Real and inverted Between F 1 and 2F 1 Beyond 2F 2 Enlarged Real and inverted At focus F 1 At infinity Infinitely large or highly enlarged Real and inverted Between focus F 1 and optical Centre O On the same side of the lens as the object Enlarged Virtual and erect Now, let us see where convex lens is used Convex lens is used as It is used as Magnifying Glass It is used to Make Microscope It is used in spectacles to correct the vision. It cures defects called hypermetropia (far sightedness) where patients can't see objects closer to them Uses of Concave Lens We saw that, image formed by concave lens is Position of the object Position of the image Relative size of the image Nature of the image At infinity At focus F 1 Highly diminished, Point - Sized Virtual and erect Between infinity and optical centre O of the lens Between focus F 1 and optical centre O Diminished Virtual and erect Now, let us see where concave lens is used Concave lens is used as It is used as a spy hole in doors (where we can see visitor from a small opening) It is used in spectacles to correct the vision. It cures defects called myopia (near sightedness) where patients can't see objects far away They are used in camera to focus on a single object. Hence we get a clearer picture It is used in Flashlights. Concave lenses are used in flashlights to widen the beam produced by the bulb. Made with lots of love and caffeine 2025, Teachoo. All rights reserved. Match the columns in the following table and explain them.Column 1Column 2Column 3FarsightednessNearby object can be seen clearlyBifocal lensPresbyopiaFar away object can be seen clearlyConcave lensNear sightednessProblem of old ageConvex lensDraw a figure explaining various terms related to a lens.At which position will you keep an object in front of a convex lens so as to get a real image of the same size as the object? Draw a figure.Give a scientific reason.Simple microscope is used for watch repairs.Give scientific reason:One can sense colours only in bright light.Give scientific reason:We cannot clearly see an object kept at a distance less than 25 cm from the eye.Explain the working of an astronomical telescope using refraction of light.Distinguish between: Farsightedness and Near sightedness.Distinguish between: Concave lens and Convex lensWhat is the function of iris and the muscles connected to the lens in human eye?Solve the following example.Doctor has prescribed a lens having power +1.5 D. What will be the focal length of the lens? What is the type of the lens and what must be the defect of vision?Solve the following example.5 cm high object is placed at a distance of 25 cm from a converging lens of focal length of 10 cm. Determine the position, size and type of the image.Solve the following example.Three lenses having power 2, 2.5 and 1.7 D are kept touching in a row. What is the total power of the lens combination?Solve the following example.An object kept 60 cm from a lens gives a virtual image 20 cm in front of the lens. What is the focal length of the lens? Is it a converging lens or diverging lens?The lens is understood as a curved and transparent piece of glass or plastic, which focuses and refracts light rays in a certain manner. The curvature of the object ascertains the extent to which light is bent and in which direction. They are used in spectacles, microscope and telescopes. Based on the shape, the lens can be grouped as a convex lens or concave lens. The former brings together the parallel beam of light, while the latter disperses it. So, the point of focus in case of the convex lens is the point where all the light rays meet, i.e. point of convergence, but if we talk about the concave lens, the focal point is the point from where the light rays seem to diverge, i.e. point of divergence.Lets understand the difference between convex and concave lens, with the help of the diagram below.Content: Convex Lens Vs Concave LensComparison ChartDefinitionKey DifferencesConclusion Comparison Chart Basis for ComparisonConvex LensConcave Lens MeaningConvex lens refers to the lens which merges the light rays at a particular point, that travels through it.Concave lens can be identified as the lens which disperses the light rays around, that hits the lenses. Figure CurveOutwardInward LightConvergesDiverges Centre and edgesThicker at the center, as compared to its edges.Thinner at the center as compared to its edges. Focal lengthPositiveNegative ImageReal and inverted image.Virtual, erect and diminished image. ObjectsAppear closer and larger.Appear smaller and farther. Used toCorrect hyperopia.Correct myopia. Definition of Convex LensConvex Lenses are the lenses that feel massive at the centre than at the edges. The curve of the lens is outward, and as the light beams pass through the lens, it refracts them and brings them together, resulting in the convergence of light, due to which it is also named as a converging lens. Look at the figure given below:So, the point where the light rays meet is known as a focal point, or principal focus and space amidst the centre of the lens and the principal focus is the focal length. Further, it generates a real and inverted image, but it can also form a virtual image when the object is placed too close to the lens. Such lenses are used to focus a beam of light on making the object look clearer and larger.Example: The lenses of a camera are a convex lens, as the light rays focus on person or object being captured.Definition of Concave LensConcave Lenses represent the type of lenses which are slender at the centre than at the borders. The shape of a concave lens is round inward that bends the beams outward, causing divergence of the rays of light falling on it, so it is known as a diverging lens. This also makes the object look smaller and farther than they really are and the image formed is virtual, diminished and upright.As you can see in the given figure, the light rays appear to be diverging from a virtual point, which is known as principal focus or focal point. Further, the length between the focal point and the centre of the lens is called focal length.Example: Concave lenses are used in the side mirrors of cars and motorbikes. They can also be used in movie projectors to spread the image. The following points are noteworthy, so far as the difference between convex and concave lens is concerned:The lens which merges the light rays around, that hits the lenses, are called a concave lens. In the convex lens, the curve is outward facing, whereas, in the concave lens, the curve faces inward.When the light rays pass through the convex lens, it converges the light rays and focuses on one point. On the other hand, when the light rays go through the concave lens, it diverges the beams, i.e. they spread out.The structure of convex lens is like, thicker at the centre and thinner at the edges. Conversely, the concave lenses are thinner at the centre and thicker at its edges, in structure.The focal length of a convex lens is positive, while that of a concave lens is negative.Generally, a convex lens forms a real image, but it can also create a virtual image when the object is in the middle of the focus and optical centre. On the contrary, the image formed by the concave lens is erect, virtual and smaller, than the object.Due to the thicker centre of convex lens, the objects are seen larger and closer. Unlike, concave lens, whose thin centre causes the object to look farther and smaller.A convex lens is used to treat hyperopia or farsightedness. In contrast, the concave lens proves helpful in the treatment of myopia or shortsightedness. ConclusionSo, with the above examples and figures, you might have got a clear understanding of the difference between the two types of lenses. Many times, convex and concave lenses are used along to produce sharper, clear and better images. Made with lots of love and caffeine 2025, Teachoo. All rights reserved. A convex lens or converging lens focuses the light rays to a specific point, whereas a concave lens or diverging lens diverges the light rays. A lens is a transparent material (either curved or flat surface) based on the principles of refraction. Convex lenses and convex lenses are often used together which is known as the Concave Convex lens. When these lenses are combined, they produce sharper images. Most eyeglass lenses use combinations of convex and concave lenses. Cameras, telescopes and microscopes use different lenses, helping us to see the world in a better way.Read More: Concave lenses and Convex lensesConcave Vs ConvexAppearanceA concave lens is thinner in the middle and thicker at the edges.A convex lens is thicker in the middle and thinner at the edges.Also known asIt is also known asDiverging LensIt is also known asConverging LensApplicationUsed in glasses, some telescopes, spy holes in the doors, etc. It is also used for the correction of the problem in short sightUsed in the camera, overhead projector, projector microscope, simple telescope, magnifying glasses, etc. It is also used for the correction of the problem in long sightFocal LengthNegative Focal LengthPositive Focal LengthIncident RaysIt diverges the incident rays away from the principal axis.It converges the incident rays towards the principal axis.Type of Image FormedThe image formed is an upright, virtual, and smaller size than the object. The position of the image formed is in between the lens and the object regardless of the objects positionThe image formed is inverted, real and larger than the object when the object is placed at 2F. The image formed is inverted, real and larger than the object when the object is placed between 2F and F. Image is formed at infinity when the object is placed at the focus.. The image formed is upright, virtual, and larger than the object when the object is placed on the same side of the lens.Recommended Videos Stay tuned with BYJUS to learn more Physics concepts with the help of interactive video lessons. Put your understanding of this concept to test by answering a few MCQs. Click Start Quiz to begin! Select the correct answer and click on the Finish buttonCheck your score and answers at the end of the quiz Visit BYJUS for all Physics related queries and study materials 0 out of 0 are wrong 0 out of 0 are correct 0 out of 0 are Unattempted View Quiz Answers and Analysis Light is a fascinating chapter included in the science syllabus. Students learn a lot of new concepts in this chapter. As they proceed to the new classes, they delve deeper into the basic and advanced concepts of light. First, they learn the features of light rays and then proceed to learn what reflection of light rays is. On proceeding further, they come to know how refraction of light rays occurs in a transparent medium. We will study the features of a concave and convex lens in this section.One of the most significant parts of this chapter is the lens. It is a transparent medium made of glass but has one or two curved surfaces. Lenses are of two types, concave and convex lenses. The nature of the curved surface determines what kind of lens it is. Studying the behaviour of the lenses will help distinguish between a concave and convex lens. Let us learn what a concave and convex lens is. What is a Convex Lens?A curved transparent medium made of glass that looks like a part of a compact sphere is called a convex lens. The surface of this lens has an external curve that looks like the surface of a glass ball. When light rays fall on the convex surface of this lens, they tend to converge from their paths. When both the surfaces are convex, they are called a biconvex lens. The behaviour of the lenses depends on the degree of curvature of a convex lens. When parallel rays fall on the convex surface of this lens, they tend to converge and meet at a single point. This point is called the focus of the lens. The focal length is the measurement of the focal point and the centre of the lens. The focal point is also called the principal focus of a lens. In this section, you will learn how the position of an object on the principal axis and its distance from the focus determine the size and type of the images formed. The thumb rule of the convex lens regarding image formation dictates the dimension and nature of images. This lens is used in different ways.Uses of a Convex LensConvex lenses are used in microscopes, magnifying glasses and eyeglasses. They are also used in the cameras to create real images of objects present at a distance. The nature of the images depends on the way these lenses are used. The prime reason for learning the uses of convex lenses is to find how light refraction is used to see things properly.The above example of a convex lens signifies how these lenses are used to create real images to serve a purpose. In eyeglasses, the convex lenses remain closer to the eyes creating a virtual image. You will also learn why the images formed are either real or virtual and how they are used for various purposes.Check the convex lens used and find how a lens is used to serve a purpose. Every use will define how the lenses are used in different ways. It will help you remember the features of this lens.What is a Concave Lens?A concave lens is a type of transparent medium made of glass that has one or two concave surfaces. The best way to recognize a concave lens is by checking the curved surface. It resembles the inner surface of a hollow sphere, almost like the mouth of a cave. These lenses are also called divergent lenses as the parallel beams incident on their surface tends to diverge from their paths.Convex lenses can never produce a real image as their property is to diverge light rays away from their path. It means that the light rays will not converge and meet at a point physically. When the rays are produced backwards in a virtual way, they meet at a point. This is the prime difference between concave and convex lens. If you follow the equation of the focal length and object distance, you will find that the image distance always comes negative. It means that the image will form on the opposite side of the refracted rays.Uses of a Concave LensA concave lens is used to diverge incident rays. This helps to create a virtual image on the opposite side of the refracting surface. Hence, these lenses are used in binoculars, telescopes, cameras, flashlights and eyeglasses. The images are erect and upright, unlike the real images. This is how you can distinguish between concave and convex lens by learning the features of light rays refracting inside the lenses.When you follow the structure and traits of a concave and convex lens, you will clearly understand the difference in the formulas. The same formula of focal length, image distance and object distance can be adjusted using the traits of each lens.Why should you differentiate between Concave and Convex Lens?The difference between a concave and convex lens will help you understand the traits of each lens. It will also help you figure out the adjustments in the formula used to calculate image distance, object distance and focal length of a lens.Difference between Convex Lens and Concave LensThe appearance of convex lenses is thicker in the middle and thinner at the edges whereas the appearance of concave lenses is thinner in the middle and thicker at the edges.A convex lens is also known as a converging lens whereas a concave lens is also known as a diverging lens.Convex can be used in a lot of things like overhead projector, camera, focus sunlight, simple telescope, projector microscope, magnifying glasses etc whereas concave lens can also be used in a lot of things like spy holes in the doors, glasses, some telescopes etc.A convex lens is being used for the correction of the long sight problem whereas a concave lens is being used for the correction of the short sight problem.Convex lenses always have a positive focal length whereas concave lenses have a negative focal length.Convex lens converges the incident rays towards the principal axis whereas concave lens diverges the incident rays away from the principal axis.The image which is being formed through the concave lens is upright, smaller in size than the object and is virtual. The position of the image which is being formed is between the lens and the objects and is regardless of the position of the object. Whereas the image which is being formed through a convex lens is real, inverted and smaller in size than the object when the object is being placed at 2F, the image which is going to be formed is inverted, of the same size as that of the object and is real. When the object is placed between 2F and F, the image which is going to be formed is inverted, larger than the object and is real. If and when the object is being placed at F (focus), there will be no image going to form. When the object is going to be placed on the same side of the lens, the image will be formed virtual, upright and larger than the object. Spherical lenses are lenses formed by connecting two spherical transparent surfaces. In general, there are two types of spherical lenses. So, lenses formed by binding two spherical surfaces bulging outward are known as convex lenses, while the lenses formed by binding two spherical surfaces such that they are curved inward are known as concave lenses. This is one of the basic differences between concave and convex lenses.Convex lenses are also known as converging lenses since the rays converge after falling on the convex lens. The concave lens are known as diverging lenses, as the rays diverge after falling on the concave lens. In this article, we will learn about image formation by concave and convex lenses. When a ray strikes concave or convex lenses obliquely at its optical centre, it continues to follow its path.When a ray, parallel to the principal axis strikes concave or convex lenses, the reflected ray passes through a focus on the principal axis.When a ray, passing through focus strikes concave or convex lenses, the reflected ray will pass parallel to the principal axis. When an object is placed at infinity, the real image is formed at the focus. The size of the image is highly diminished and point size.When an object is placed beyond the centre of curvature, the real image is formed between the centre of curvature and focus. The image size will not be the same as the object. It will be diminished in size.When an object is at the centre of curvature, the real image is formed at the other centre of curvature. The size of the image is the same as compared to that of the object.When an object is placed in between the centre of curvature and focus, the real image is formed behind the centre of curvature. The size of the image is larger than that of the object.When an object is placed at the focus, a real image is formed at infinity. The size of the image is much larger than that of the object.When an object is placed in between focus and optical centre, a virtual image is formed. The size of the image is larger than that of the object.Watch the video and understand the concepts of Lens Formula, Magnification and Power of Lens When an object is placed at infinity, a virtual image is formed at the focus. The size of the image is highly diminished and point size.When an object is placed at a finite distance from the lens, a virtual image is formed between the optical centre and the focus of the convex lens. The size of the image is smaller than that of the object. Put your understanding of this concept to test by answering a few MCQs. Click Start Quiz to begin! Select the correct answer and click on the Finish buttonCheck your score and answers at the end of the quiz Visit BYJUS for all Physics related queries and study materials 0 out of 0 are wrong 0 out of 0 are correct 0 out of 0 are Unattempted View Quiz Answers and Analysis

What is the difference between concave and convex lens class 10. Define convex lens class 10. Convex lens. Convex vs concave lens. What is concave and convex lenses. What is concave lens class 10. What is convex lens class 10.