QUIZIZZ Worksheets

Name

Exploring Optics Concepts

Total questions: 15

Worksheet time: 8mins

Instructor name: Dr. Ramanathan Saitechinfo

Class

Date

1. What are the key characteristics of a concave mirror?

a) Only forms virtual images

b) Key characteristics of a concave mirror include inward curvature, ability to form real and virtual images, focal point in front, and magnification of close objects.

c) Outward curvature

d) Focal point behind the mirror

2. List two applications of convex mirrors.

a) Car headlights

b) Bathroom mirrors

c) 1. Vehicle side mirrors 2. Security surveillance systems

d) Window glass

3. Derive the mirror formula and explain each term.

a) f = v + u

b) 1/f = 1/v + 1/u

c) 1/f = 1/u - 1/v

d) 1/v = 1/f - 1/u

4. What is the critical angle in total internal reflection?

a) The critical angle is calculated using θc = arcsin(n2/n1).

b) The critical angle is always 90 degrees.

c) The critical angle is calculated using θc = sin(n1/n2).

d) The critical angle is the angle of incidence at which light is completely absorbed.

5. Explain the conditions necessary for total internal reflection to occur.

a) Total internal reflection occurs when light travels from a denser medium to a less dense medium at an angle greater than the critical angle.

b) Total internal reflection can happen at any angle of incidence regardless of the media involved.

c) Total internal reflection requires a light source that emits ultraviolet light.

d) Total internal reflection occurs when light travels from a less dense medium to a denser medium.

6. Describe one practical application of total internal reflection.

a) Optical fibers for communication.

b) Mirrors for reflecting light

c) Prisms for dispersing light

d) Lenses for magnifying objects

7. Calculate the focal length of a concave mirror if the object distance is 30 cm and the image distance is 15 cm.

a) -30 cm

b) -15 cm

c) 15 cm

d) 30 cm

8. What type of image is formed by a convex mirror?

a) A virtual, inverted, and enlarged image.

b) A real, upright, and diminished image.

c) A real, inverted, and enlarged image.

d) A virtual, upright, and diminished image.

9. If the radius of curvature of a concave mirror is 20 cm, what is its focal length?

a) 5 cm

b) -20 cm

c) 15 cm

d) -10 cm

10. How does the image size change when using a convex mirror?

a) The image size remains the same as the object.

b) The image size increases and is larger than the object.

c) The image size decreases and is always smaller than the object.

d) The image size can be either larger or smaller depending on the distance.

11. State the mirror formula and its significance in optics.

a) $1/f = 2/v + 1/u$
b) $f = v + u$
c) $1/f = 1/v + 1/u$
d) $1/f = 1/u - 1/v$

12. What happens to light when it hits the boundary at an angle greater than the critical angle?

a) The light bends away from the boundary at a sharper angle.
b) The light is totally internally reflected.
c) The light passes through the boundary without any change.
d) The light is absorbed by the boundary material.

13. Provide an example of total internal reflection in everyday life.

a) Water droplets on a window
b) Mirrors reflecting light
c) Fiber optic cables
d) Lenses in glasses

14. Calculate the image distance for an object placed 10 cm in front of a concave mirror with a focal length of 5 cm.

a) 5 cm
b) -5 cm
c) 15 cm
d) -10 cm

15. What is the difference between real and virtual images in mirrors?

a) Virtual images can be projected onto a screen.
b) Real images are always upright and virtual images are inverted.
c) Real images are always larger than virtual images.
d) Real images can be projected and are inverted; virtual images cannot be projected and are upright.

Answer Keys

1. b) Key characteristics of a concave mirror include inward curvature, ability to form real and virtual images, focal point in front, and magnification of close objects.
2. c) 1. Vehicle side mirrors 2. Security surveillance systems
3. b) 1/f = 1/v + 1/u
4. a) The critical angle is calculated using θc = arcsin(n2/n1).
5. a) Total internal reflection occurs when light travels from a denser medium to a less dense medium at an angle greater than the critical angle.
6. a) Optical fibers for communication.
7. b) -15 cm
8. d) A virtual, upright, and diminished image.
9. d) -10 cm
10. c) The image size decreases and is always smaller than the object.
11. c) 1/f = 1/v + 1/u
12. b) The light is totally internally reflected.
13. c) Fiber optic cables
14. d) -10 cm
15. d) Real images can be projected and are inverted; virtual images cannot be projected and are upright.