

Science Focus 8

Light and Optical Systems

Pop Quiz Master

(5 questions) for each Topic

Answer Key

Science Focus 8 Topics	Questions				
	1.	2.	3.	4.	5.
Topic 1 - What is Light?	A	C	B	D	C
Topic 2 – Reflection	C	B	C	C	A
Topic 3 - Refraction	D	B	C	A	B
	Question 6 – A - Incidence B – Refraction C – Incidence D - Refraction				
Topic 4 - Lenses & Vision	B	C	C	A	C
	Question 6 – Activity 1 – double convex , converging				
	Question 6 – Activity 2 – double concave , diverging				
Topic 5 - Extending Human Vision	A	C	D	B	A
Topic 6 – Color (No longer part of the curriculum)					
Topic 7 - The Wave Model of Light	C	B	B	C	D
Topic 8 - Beyond Light	D	A	B	C	B

Light and Optical Systems

Topic 1 - What is Light? Practice Quiz

1. Radiation is the type of energy transfer which does not require ...
 - matter
 - heat
 - waves
 - light

2. Light-producing technologies, such as incandescent and florescent lights, are examples of ...
 - bioluminescence
 - natural light source
 - artificial light source
 - chemical luminescence

3. The absorption of radiant energy, on a dark surface, depends on the light's ...
 - form
 - intensity
 - direction
 - temperature

4. Ultraviolet light energy is absorbed by chemical particles giving visible light energy. This transformation describes ...
 - incandescence
 - phosphorescence
 - bioluminescence
 - florescence

5. Why is the disposal of florescent light tubes a challenge?
 - because they could cut someone, if they were broken
 - because the materials they are made of are not biodegradable
 - because the materials they are made of are toxic
 - because they cannot be recycled

Light and Optical Systems

Topic 2 - Reflection Practice Quiz

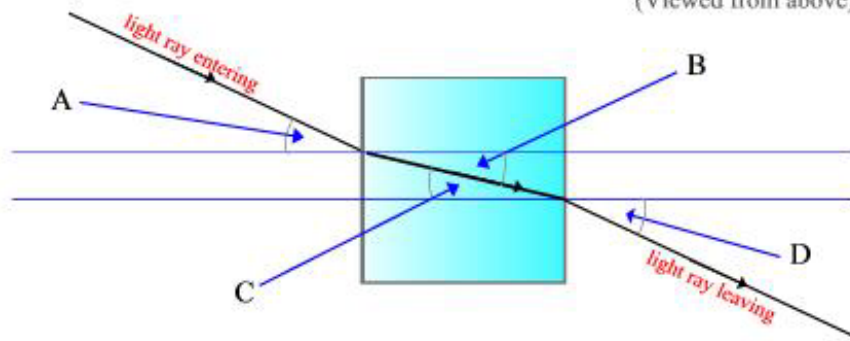
1. Reflection is the process in which light strikes a surface and bounces off that surface. The reflected ray will bounce back directly to the light source if it is lined up with the ...
 - incident ray
 - reflected ray
 - normal line
 - reflecting surface
2. To discover the laws of reflection it is necessary to use a ...
 - ray box
 - plane mirror
 - reflecting surface
 - normal line
3. In stating the law of reflection, that *the angle of incidence equals the angle of reflection* it is necessary to understand that this is a law because ...
 - a scientist has stated it
 - this relationship happens most of the time
 - this relationship always happens
 - science is always accurate and precise
4. When you attempt to focus an image on a screen, using a concave mirror, but cannot, yet, you can see an image when are looking into the same concave mirror, the image is called a ...
 - convex distortion
 - concave image
 - virtual image
 - reflected distortion
5. Pool players use the law of reflection to improve their game. When the cue ball bounces off the cushion on the side and hits the target ball, the action is called a ...
 - bank shot
 - cushion shot
 - angled shot
 - image shot

Light and Optical Systems

Topic 3 - Refraction Practice Quiz

1. Refraction is the bending of light when it travels from one medium to another. What direction does the light bend when it travels from a medium of greater density to one of lesser density?
 - along the normal
 - along the perpendicular
 - towards the normal
 - away from the normal
2. When light is refracted, the angle of incidence increases and the angle of refraction ...
 - depends on the intensity of the light
 - increases, depending on the material
 - decreases, but only by one half
 - increases by double
3. Mirages cause an illusion of a watery surface. This illusion is actually ...
 - water drops reflecting the light
 - water drops refracting the light
 - the sky refracted by warm air
 - the sky reflected by warm air
4. When light strikes a surface and is absorbed, the light ...
 - changes into another form of energy
 - bounces off in many different directions
 - travels through it in a different direction
 - happens only when it is a smooth shiny surface
5. During refraction, when the angle of incidence is doubled, the angle of refraction is ...
 - also doubled
 - not necessarily doubled
 - decreased by the same amount
 - decreased by about half

6. Label the angles produced when a light ray goes through a refraction tank.
(Viewed from above)



A is the angle of _____

B is the angle of _____

C is the angle of _____

D is the angle of _____

Light and Optical Systems

Topic 4 - Lenses and Vision Practice Quiz

1. When light passing through a lens, the light is bent, causing the rays of light to diverge. The type of lens is a ...
 - convex lens
 - concave lens
 - optic lens
 - diamond prism lens

2. When light rays pass through a convex, lens the image that is formed is ...
 - diverted
 - converted
 - inverted
 - implied

3. The lens of the human eye is a convex lens. That means that when it takes in light from an object, it refracts the light rays, by focusing them on the retina. If the eye is too long, the image will form in front of the retina. This condition is called ...
 - retina dysfunction
 - optical illusion
 - near-sightedness
 - far-sightedness

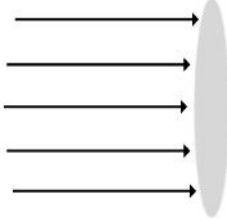
4. When comparing the eye and the camera, certain parts perform the same function. The retina of the eye is similar to the part of the camera called the ...
 - film
 - shutter
 - diaphragm
 - focussing ring

5. The aperture of a camera controls the amount of light coming into the camera, so that an clear image can be formed. This aperture opening device is similar to the pupil of the eye. It is called the ...
 - iris
 - shutter
 - diaphragm
 - optic nerve

6. Light passes through a lens and is refracted. Different lenses refract light differently. Complete the following illustrations and sentences (following each question) as directed.

Activity 1 (3 points)

Draw what happens to the light rays going through this lens.

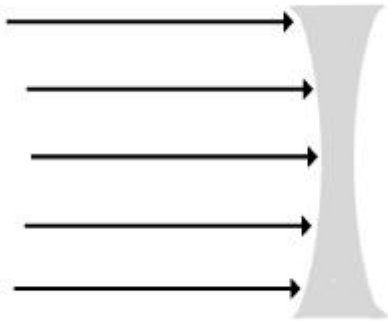


What type of lens is it? It is a _____ lens.

What happens to the light rays? They are _____ .

Activity 2 (3 Points)

Draw what happens to the light rays going through this lens.



What type of lens is it? It is a _____ lens.

What happens to the light rays? They are _____ .

Light and Optical Systems

Topic 5 - Extending Human Vision Practice Quiz

1. Telescopes use different types of mirrors to collect the rays of light. The type of telescope that uses a concave mirror to collect the rays of light from distant objects is the ...
 - reflecting telescope
 - refracting telescope
 - prism telescope
 - magnifying telescope

2. A binocular uses prisms to redirect light from distant objects. These prisms act like ...
 - concave lenses
 - convex lenses
 - plane mirrors
 - refracting mirrors

3. In order to have the greatest magnification possible in a reflecting telescope, it is necessary to have a ...
 - very large concave mirror
 - very thick objective lens
 - very strong plane mirror
 - great distance between the object and the image

4. Magnifying glasses are used to make object look bigger than they usually are. New developments and discoveries have been able to make magnifying instruments (known as microscopes) much stronger. When Anton van Leeuwenhoek was able to see bacteria, for the first time, the magnification he needed was about ...
 - 200X
 - 280X
 - 1800X
 - 2000X

5. Microscopes have limits in terms of their magnification because of the types of lenses that are used. To magnify objects by different amounts, scientists would use this part of the compound microscope.
 - objective lens
 - eyepiece lens
 - condenser lens
 - adjustment lens

Light and Optical Systems

Topic 7 - The Wave Model of Light Practice Quiz

1. Wavelengths can be determined by measuring ...
 - the height of a crest
 - the depth of a trough
 - the distance between two crests
 - the difference in height between a crest and a trough

2. The rate at which an object is moving up to the top of a crest and down to the bottom of a trough is called ...
 - amplitude
 - frequency
 - hertz
 - rest position

3. When light passes through a small opening, the waves spread out. How far they spread out depends on this ...
 - amplitude
 - frequency
 - wavelength
 - one complete trough

4. At sunset, the colors we are able to see are reds and oranges. This is made possible because when light hits the atmosphere, this happens.
 - blue and violet are absorbed by dust particles
 - red and violet are refracted through the atmosphere
 - blue and orange are reflected back into space
 - red and orange pass around the particles

5. A laser demonstrates the difference between incoherent light and coherent light. The laser, which is used for many purposes gives off coherent light, which are ...
 - waves with multiple frequencies
 - waves with only one frequency
 - waves with variable wavelengths
 - waves with a variable amplitude

Light and Optical Systems

Topic 8 - Beyond Light Practice Quiz

1. The different between water waves and light waves is that these vibrate ...
 - the different colors of light
 - electrical and magnetic fields
 - wavelengths and frequencies
 - particles in the magnetic spectrum

2. The frequency of different colors of light waves is often given in scientific notation. The frequency of orange light is 500,000,000,000,000 Hz. This is can be represented, using scientific notation, as ...
 - 5.0×10^{14}
 - 5.0×10^{13}
 - 500.0×10^{12}
 - 5000.0×10^{11}

3. Infrared radiation is heat radiation. This type of radiation can have a useful application. They are used in ...
 - computers to keep the chips warm
 - restaurants to keep food warm
 - refrigerators to trap the heat
 - microwaves to cook the food

4. There are many different types of radio waves. A transmitting station can send these types of signals to an orbiting satellite, which will amplify them and send them back to a receiving station on the Earth. The type of signal used in satellite communications is ...
 - AM Radio
 - FM Radio
 - Microwave
 - Shortwave

5. A special blocking agent - **sunscreen** - is added to the lotion we use to avoid sunburn. This blocking agent reflects the UV rays and can help prevent cancerous growths on the skin. The strength of this blocking agent is determined by the ...
 - SDF
 - SPF
 - SVF
 - SBF