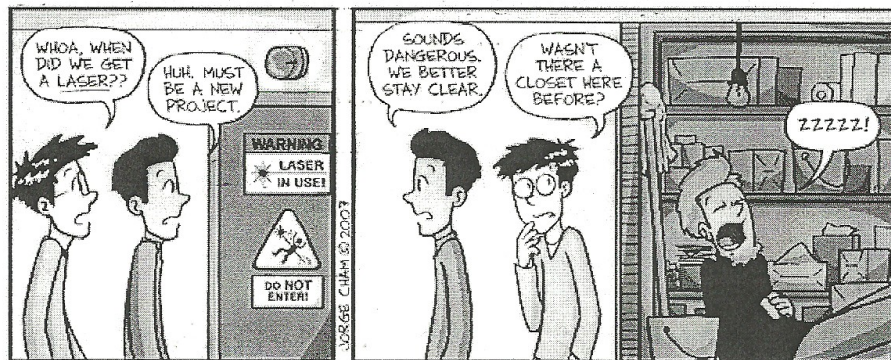


Science 8
Optics Unit Test

Name: Key

1. You have the whole block to write the test.
2. You may use a 1 pg handwritten "cheat sheet" to assist you.
3. You may not use other notes or the textbook during the test.
4. You must write in black pen, blue pen or pencil.
5. Please answer all questions.



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Section 1: Fill in the Blank

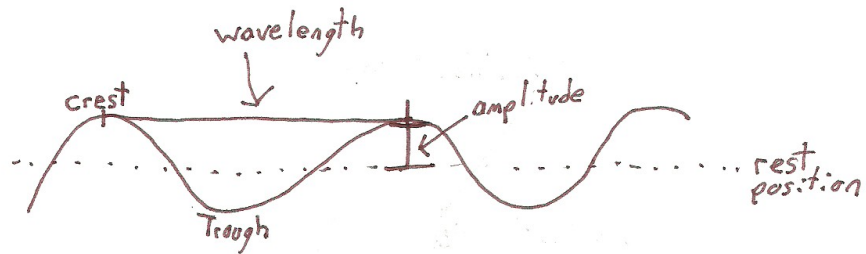
Use the following words to fill in the blanks; each word will be used only once, some words will not be used at all:

Amplitude	Medium	Refraction
Astigmatism	Microscope	Retina
Cone	Near sighted	Rod
Cornea	Normal	Sclera
Crest	Opaque	Telescope
Far sighted	Optic nerve	Translucent
Focus	Photon	Transparent
Frequency	Pupil	Trough
Hertz	Reflected ray	Wave
Incident ray	Reflection	Wavelength
Iris	Refracted ray	

1. The distance in a wave from one crest to the next is that wave's wavelength.
2. A measure of frequency (cycles per second) is Hertz.
3. A sound wave travels through the air. The sound wave's medium is the air.
4. A particle of light is a photon.
5. If some light passes through a material but is scattered that material is translucent.
6. If no light passes through a material, that material is opaque.
7. Before a ray of light hits a mirror it is called the incident ray.
8. The imaginary line at a right angle to the mirror is the normal.
9. If light changes speeds by moving from one medium into another it will bend, this process is called refraction.
10. The part of the eye which has colour and which controls how much light enters the eye is called the iris.
11. If someone can see close objects but not distant objects they are near sighted.
12. The condition when someone's cornea is irregularly shaped is called astigmatism.
13. A(n) telescope is used to see objects farther away than would normally be possible.
14. In the human eye we focus by changing the shape of the lens, in a camera we do this by changing the distance between the lens and the recorder.

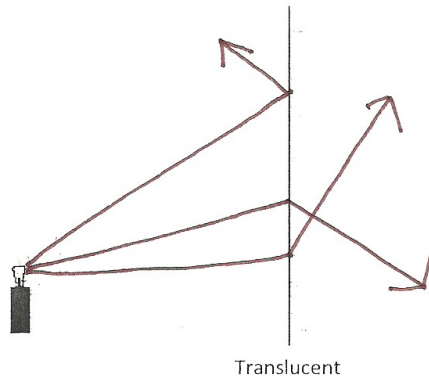
Section 2 Diagrams:

15. Draw and label a diagram of a wave showing (and labeling) the crest, trough, amplitude, wavelength, and rest position.



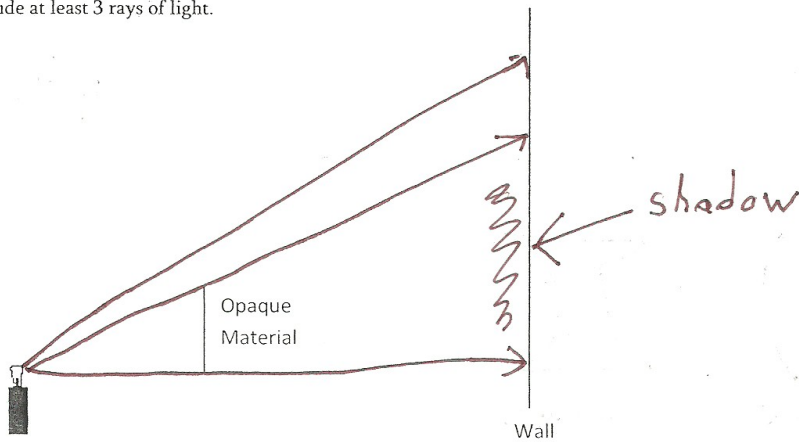
1/6

16. Complete the ray diagram of light leaving a candle and hitting a translucent material; include at least 3 rays of light.



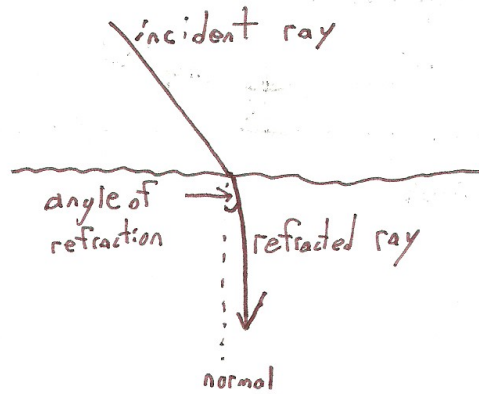
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17. Complete the ray diagram showing the formation of a shadow, be sure to label the area on the wall where the shadow occurs; include at least 3 rays of light.



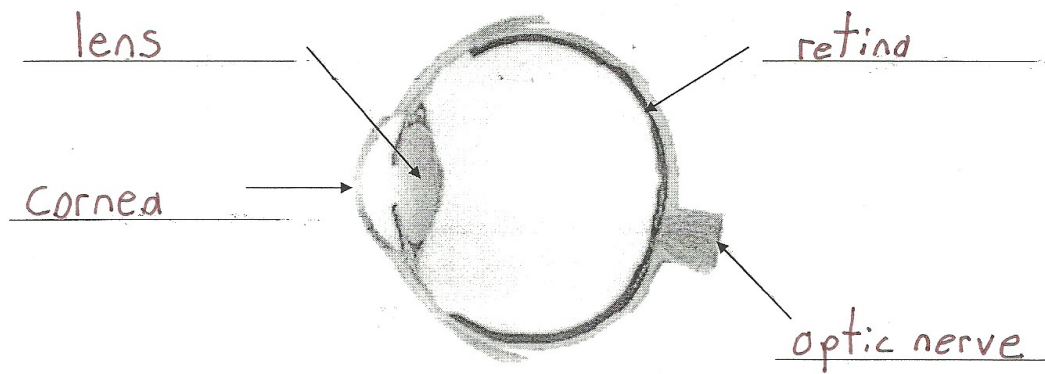
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18. Draw a ray diagram showing light refracting as it moves from air into water, be sure to include and label the incident ray, the refracted ray, the normal and the angle of refraction. Note: light moves slower in water than in air.

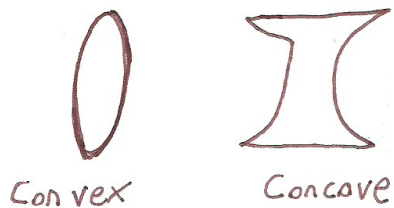


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19. Label the diagram of an eye below using the terms: optic nerve, cornea, lens, and retina.



20. Draw and label a convex and a concave lens.



4

2

Section 3 Matching and Short Answer:

21. Match the lens with the type of image it produces (2 spaces will be left blank)

A: EXAMPLE	Upright, smaller	B
B: Concave lens	Upright, same size	
C: Convex lens (object between lens and focal point)	Upright, enlarged	C
D: Convex lens (object between one and two focal lengths from lens)	EXAMPLE	A
E: Convex lens (object more than two focal lengths from lens)	Inverted, smaller	E
	Inverted, same size	
	Inverted, enlarged	D

22. List a common use for each type of mirror

Plane Mirror	bathroom mirror
Concave Mirror	in a flashlight
Convex Mirror	store security

23. List three devices which extend human vision (i.e. things to see in ways they could not with the naked eye).

telescope
microscope
glasses, night vision goggles, binoculars

24. List the eight 8 parts of the electromagnetic spectrum in order from longest wavelength to shortest, and give a common use for each (the first one has been done for you.)

Type of electromagnetic radiation	Use
Radio waves	AM/FM Radio
Micro waves	cooking food
Radar	detecting incoming planes
Infrared	"heat vision" goggles
Visible Light	seeing
Ultraviolet	detect fake money
X-rays	seeing broken bones
Gamma rays	treating cancer

25. What do waves transport?

energy

/15

26. A wave has frequency of 2 Hz, how many wave crests will pass in 10 seconds?

20

/1

/1

27. 30 waves pass under a boat in 60 seconds, what is the frequency of the waves in Hertz?

0.5

/1

28. A wave has amplitude of 5 meters, what is the difference in height between its crest and trough?

10m

/1

29. If speed stays the same but wavelength is increased, how will a wave's frequency change?

decrease

/1

30. John and Susan sing a song at the same volume. Susan has a higher frequency voice than John. Whose voice is transmitting more energy?

Susan

/1

31. Finish the Law of Reflection below:

The angle of incidence is equal to the angle of reflection

/1

32. When all the colours of light are mixed together, what is the resulting colour?

white

/1

33. What colour of visible light has the longest wavelength?

red

/1

34. Explain what happens when white light strikes a red shirt (be sure to use the words reflect and absorb.)

All colours except red are absorbed, red is reflected.

/2

35. What kind of vision are cone cells used for?

Night vision

/1

36. How does the lens in the human eye change when we focus on distant objects?

becomes thinner

/1

37. What kind of lens is used to correct the vision of near sighted people?

concave

/1

38. Explain why humans have "blind spots."

where the optic nerve enters the eye there are no rods or cones so any light hitting that spot is not recorded

/2

