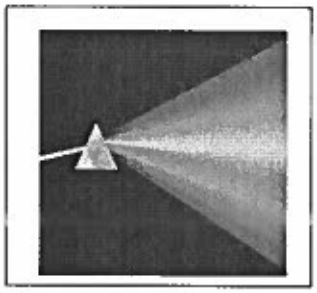


Light Glossary

Ray: is a straight line of light.

Natural light: is a source of light that occurs naturally without human intervention or creation like fire or lightening.

Artificial light: are light sources that are created by people like fireworks or light bulbs.

Visible light: a rainbow contains all the colours that can be seen with the human eye.

Infrared light: electromagnetic radiation from the sun is felt as heat.

Ultra violet light: : electromagnetic radiation from the sun that causes change of pigment colour such as tanning.

Reflect: light sources are grouped by how light is made or reacts. When light bounces from another source it is called reflecting.

Emit: light sources are grouped by how light is made or reacts. When sources create their own light source it is called emitting.

Optical device: any tool that uses or makes or reflects light like kaleidoscopes, mirrors or periscopes.

Luminous: an object that makes it's own light is a luminous source (like the sun).

Illuminated: when an object is lit up by another source (like the moon reflecting the sun's light).

Translucent: is when most of the light is scattered bouncing off in all directions. Translucent materials that allow some light to pass through but not clearly. Example tissue paper.

Transparent: are materials that allow light to pass through. you can see through transparent objects because they do not scatter the light or stop it. AN example would be a glass window.

Opaque: are materials that block light from passing through. Opaque objects absorb all the light or cause it to bounce off. Opaque objects also cause shadows such as blinds.

Prism: is a clear, smooth block with ends that are triangular shaped. Usually a prism is used to bend or changes the direction of light enabling to see the colour spectrum.

Spectrum: the name for the colours of the rainbow.

ROY G. BIV: a device for helping us remember the colours of the spectrum. Red Orange Yellow Green Blue Indigo Violet.

Light waves: a theory of how light travels likes waves farther from the source.

Electromagnetic waves: is a radiant energy that is a kind of energy that travels outward from a central source. Some examples are cosmic rays, gamma rays, X-rays, ultraviolet rays, and radio waves.

Electromagnetic radiation: this term is used to describe all the energy that comes from the sun. Some can be seen, others affect our body, some used for technology. Examples are radio waves, gamma rays and ultraviolet rays.

Reflection: what happens when light hits a mirror and turns a corner.

Refraction: when light is "bent" going from one material to another.

Blind spot: this part of the eye that has no cones or rods and "can't see".

Rainbow: refraction of sunlight causes this after a rainstorm.

White light: sunlight and light from electric lightbulbs is seen as white light.

Cornea: a transparent (see through) cover that protects the eye.

Pupil: a "hole" in the eye that lets light into the eye(the black part at the center of the eye) It dilates or makes the pupil smaller the more light that gets in.

Iris: a set of muscles on the edge of the pupil that control the size of the pupil. (the colour part).

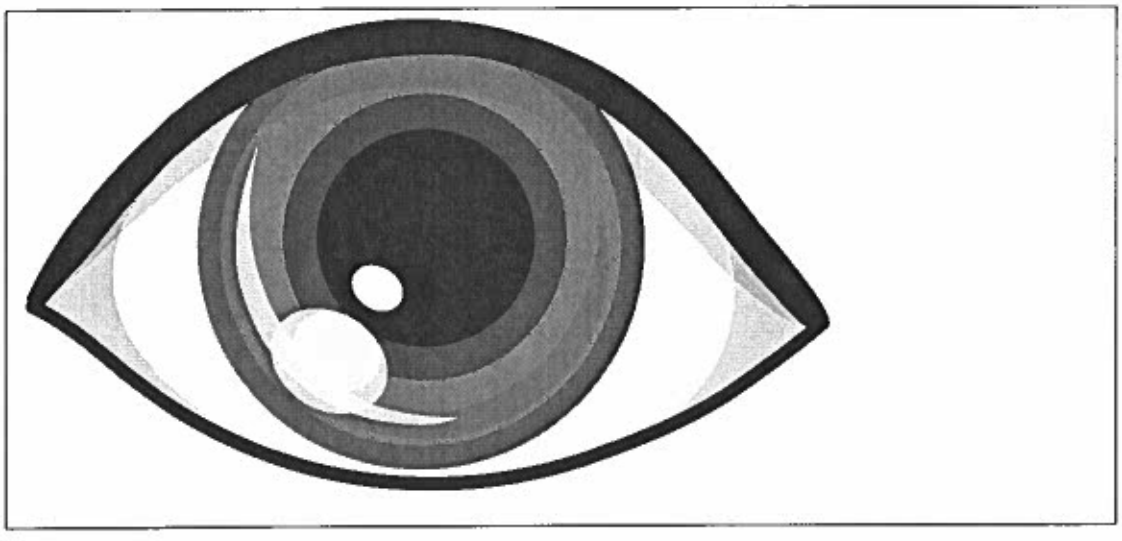
Retina: acts like a screen and contains many cells which react to light(cones and rods).

Lens: bends the light and focuses light on the retina at the back of the eye.

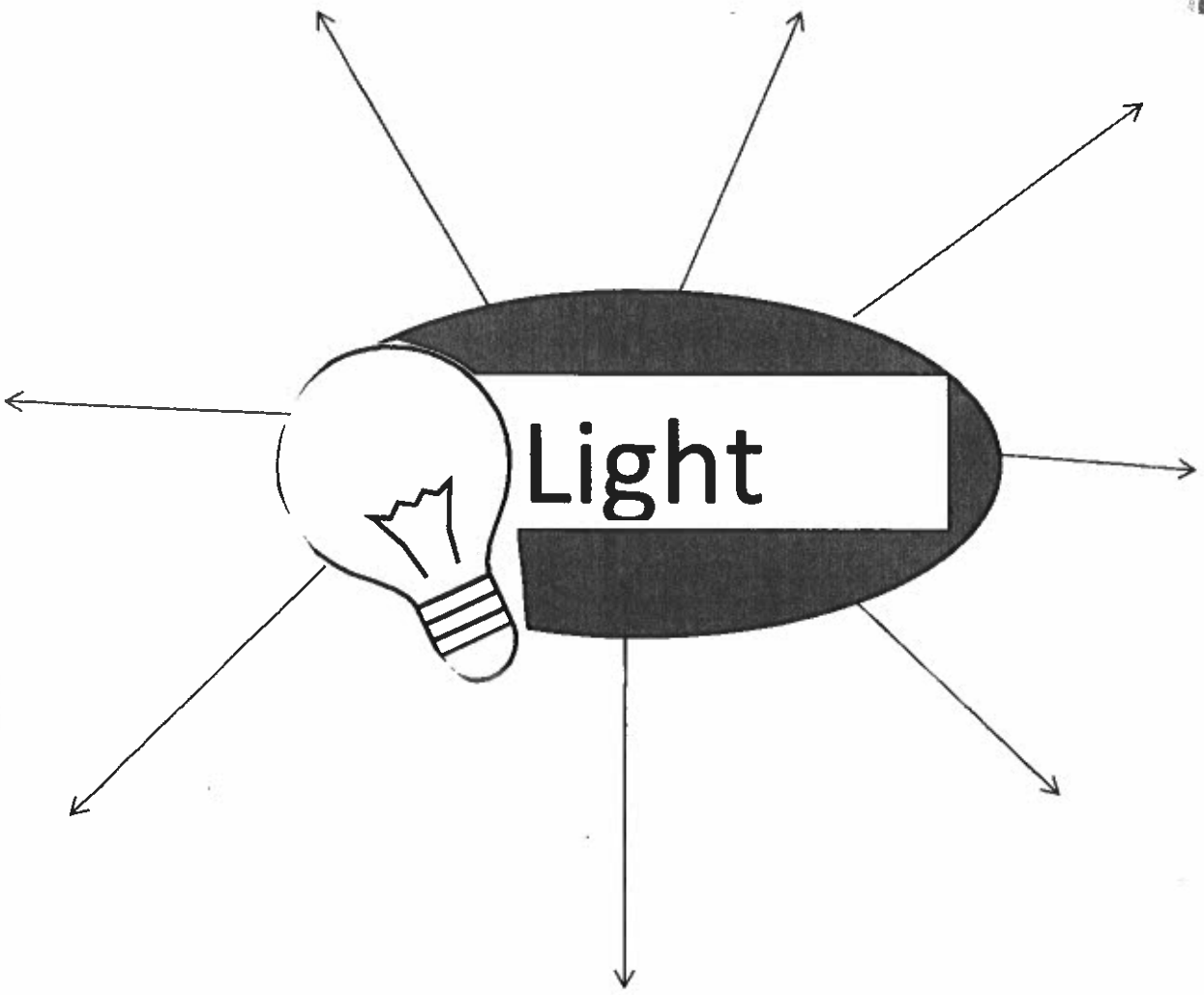
Rods: cells in the retina that see light and dark but not colour.

Cones: cells in the retina that can see colour.

Optic nerve: sends messages from the eye to the brain.



Brainstorm words related to Light

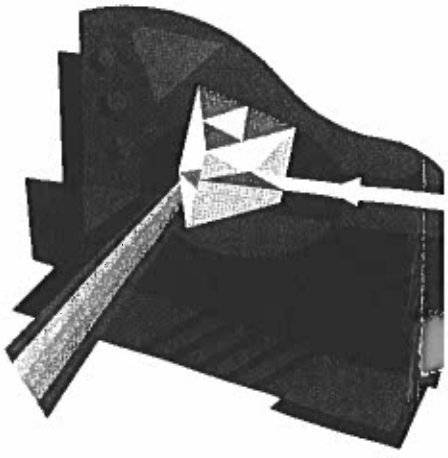


Write three inquiry questions you have about light:

1.

2.

3.



Name: _____

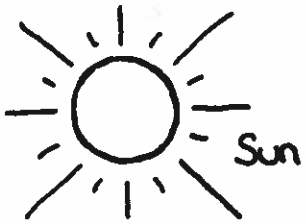
Light KWL Chart

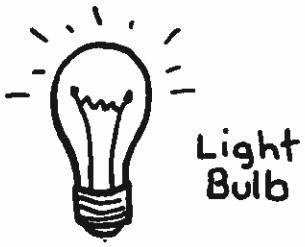
What I Know About Light (K)	What I Want to Learn About Light (W)	What I Learned About Light (L)

Light

Light is a kind of energy and does not have any mass.

Some objects, like the sun, make their own light. They are called luminous.





Things that are lit up by another object and do not have their own source of light are said to be illuminated.

Traffic Signs

Questions (Answer In Full Sentences - A.I.F.S.)

1) **In the summer, a firefly will make its own light to try and attract other fireflies. Is a firefly luminous or illuminated? (explain)**

2) **When there is a full moon, it is almost bright enough outside to read by. Is the moon luminous or illuminated? (explain)**

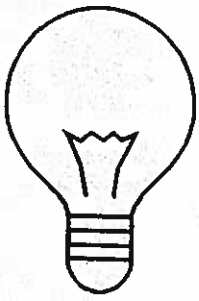
3) **A firefly gives off natural light while a lightbulb gives off artificial light. What is the difference between natural and artificial light?**

Name: _____

Going on a Light Hunt

In 10 minutes, how many sources of light can you find in your home and surrounding area? List them in the table below. Then, use checkmarks to show which sources of light give off light only or give off light and heat. Compare lists with a classmate. Circle the sources of light that you both recorded. Add any sources of light that you did not record.

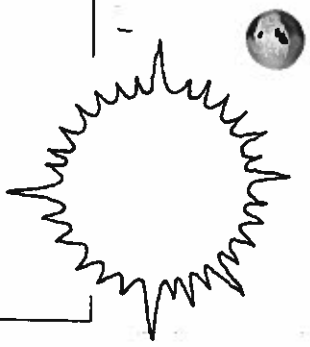
Sources of Light	Gives Off Light Only	Gives Off Light and Heat



Sources of Light

Luminous *objects produce light*

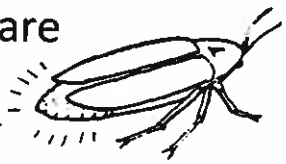
Illuminated *objects reflect light*



sun—nuclear fusion

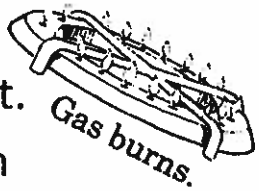
Light sources are luminous or illuminated. ***Luminous*** *objects produce their own light and can be* ***natural*** *or* ***artificial.*** Our most important source of natural light is the sun. This tremendous mass of incandescent gas, produced by nuclear fusion, provides the earth with light and other types of energy.

Illuminated objects do not produce light, but are seen because they reflect light from another object. The moon and planets receive light from the sun and reflect it; they are illuminated objects.



firefly—chemical

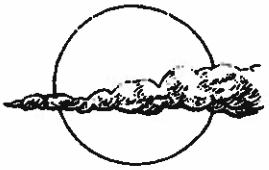
Fireflies produce light through chemical reaction. Artificial light is made by people. Common sources of this light are candles, kerosene lamps, oil lamps, natural gas lamps, incandescent lamps, fluorescent lights, and neon lights.



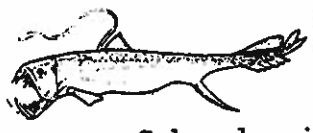
Gas burns.

Electricity is most often used to produce artificial light. However, electricity is generated by water power or steam power from coal. Both power sources can be traced back to the sun.

lightning—burning



moon—reflected

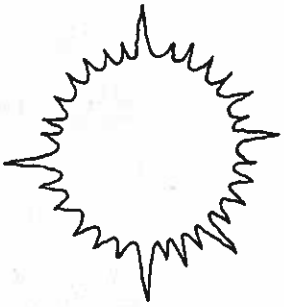


deep–sea fish—chemical

Sources of Light

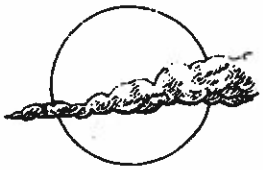
Luminous objects produce light. Illuminated objects reflect light.

Natural Light Sources

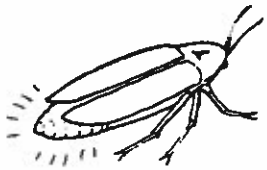


sun—nuclear fusion

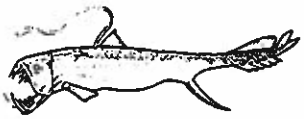
lightning—burning



moon—reflected



firefly—chemical

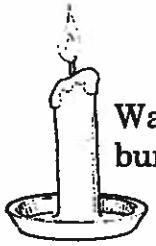


deep–sea fish—chemical

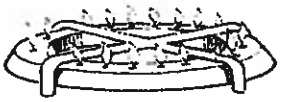
Light Sources

Wood burns.

Whale oil burns.

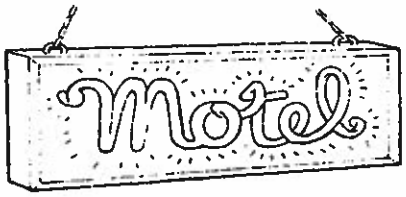


Wax burns.

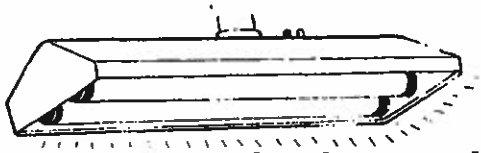


Gas burns.

Filament glows.



Neon gas glows.



Mercury gas causes phosphorus to glow.

1. Circle the picture of a natural light source that is not luminous.
2. Which sources of natural light also produce heat? _____
3. Circle three artificial light sources that require electrical energy to produce light.
4. Which two artificial sources of light pictured here are most often used for heat?

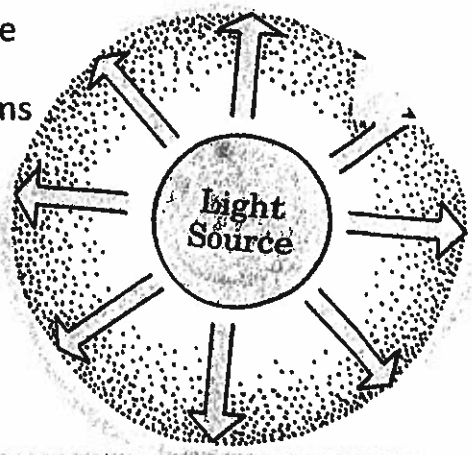
   _____

5. Write the word or words that will make each sentence a true statement.
   a. Our most important source of light energy is the _____.
   b. We are able to see objects around us because of _____ light.
   c. Deep–sea fish and fireflies produce light through a _____ reaction.
   d. Even though electricity is generated by water or steam, it can still be traced back to the _____.
   e. Planets are _____ objects because they reflect light from another source.

How Does Light Travel Name:

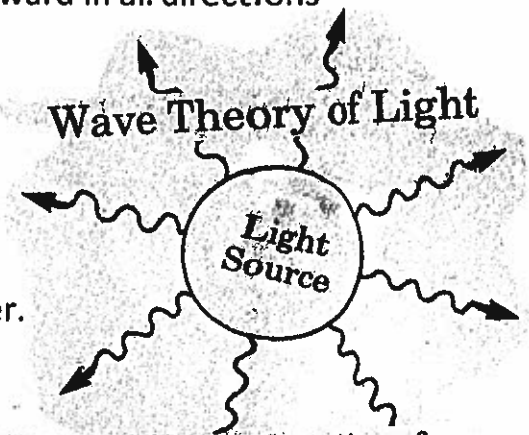
Light travels away from its source in all directions in a straight line. Light travels at a speed of about 300, 000 kilometers (186, 300 miles) per second.

Throughout history, scientists have proposed several theories in attempt to explain the nature of light. Sir Isaac Newton proposed the ***particle theory of light*** which considers light to be streams of particles moving out in all directions. It was thought that the more particles striking the human eye per second, the brighter the light would appear. The fewer the particles that reach the eye, the dimmer the light would appear.



Particle Theory of Light
Streams of tiny particles move in all directions from the source, like buckshot.

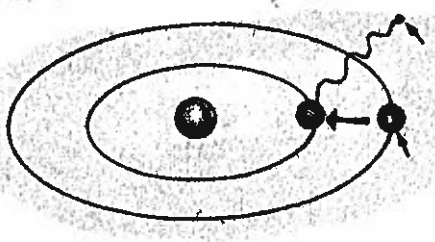
Scientists also theorize that light is waves moving outward in all directions like waves on water. The closer one is to the source, the larger and stronger the waves would be. This would then cause the light to appear bright. As the waves move farther from the source, they spread out and grow smaller. And the light appears dim. This theory is called the ***wave theory of light.***



Light travels in waves in all directions from source, like waves from a disturbance in water.

The present theory of light, developed by Niels Bohr and other scientists, assumes that electrons in atoms may move from a higher

Quantum Theory of Light

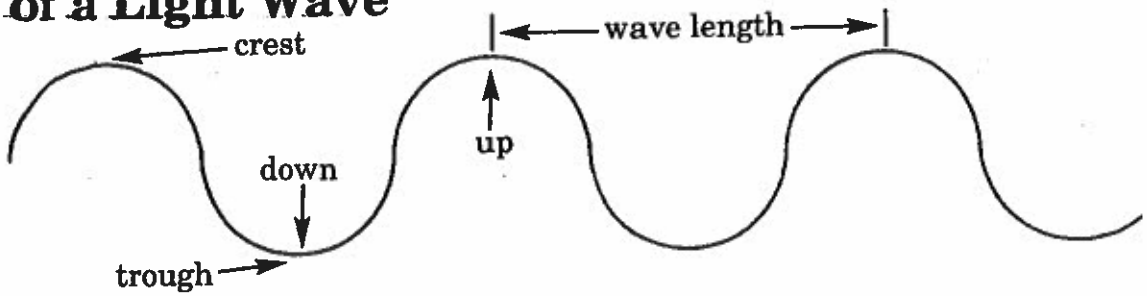


Bundles of light energy, called **quanta,** travel in waves.

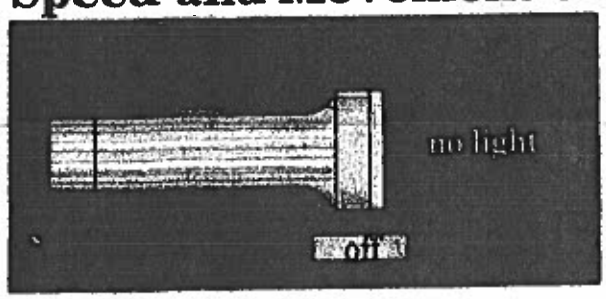
energy level orbit to a lower energy level orbit. In doing so, small bundles (quanta) of energy, called photons, are released. The bundles move in waves, which move in straight lines. This is known as the ***quantum theory of light.***

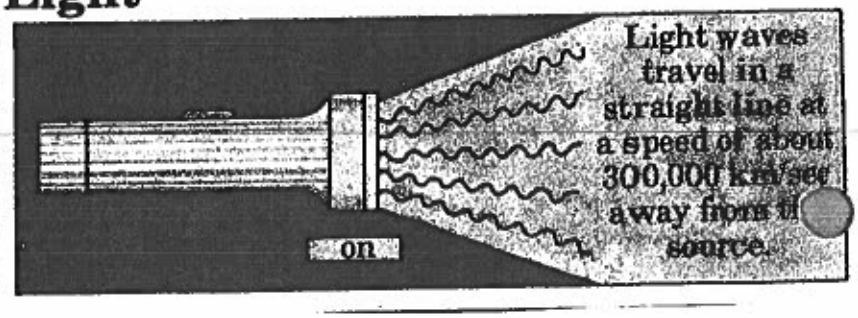
Electromagnetic waves move up and down at the same time that they move forward in straight lines. Therefore, each wave has a length and frequency. ***Wavelength*** is the distance between two waves, and ***frequency*** is the number of waves that pass a given point in one second. A ***crest*** is when the wavelength reaches the height of its movement. A ***trough*** is when the wavelength reaches the depth of its movement. Light is not instantaneous, but it is extremely fast, moving about 300,000 kilometers (186, 300 miles) per second.

Parts of a Light Wave

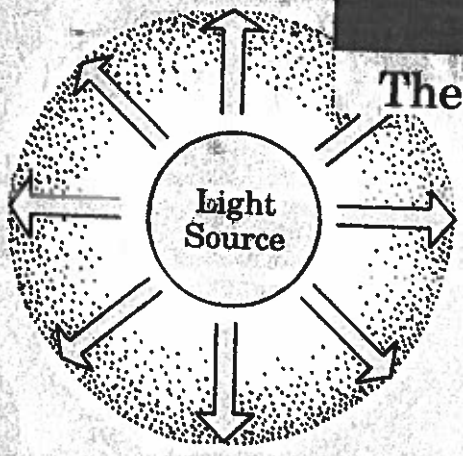


Speed and Movement of Light



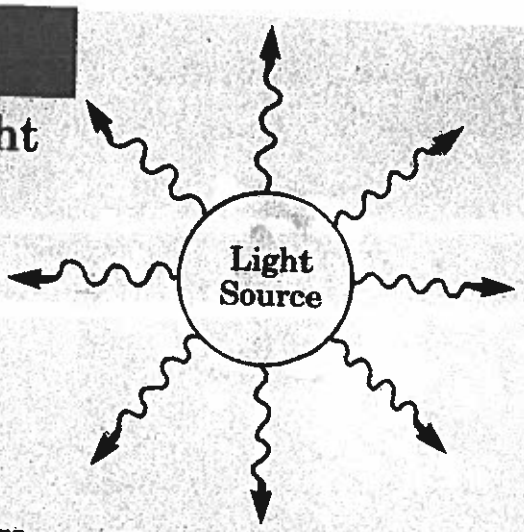


Theories of Light



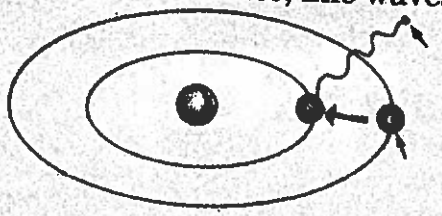
Particle Theory of Light

Streams of tiny particles move in all directions from the source, like buckshot.



Wave Theory of Light

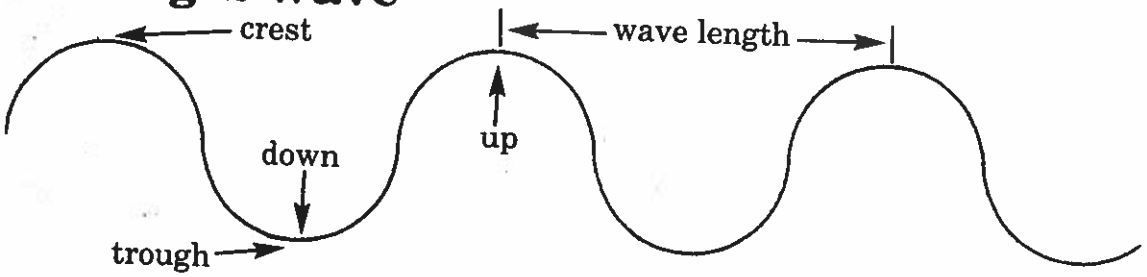
Light travels in waves in all directions from source, like waves from a disturbance in water.



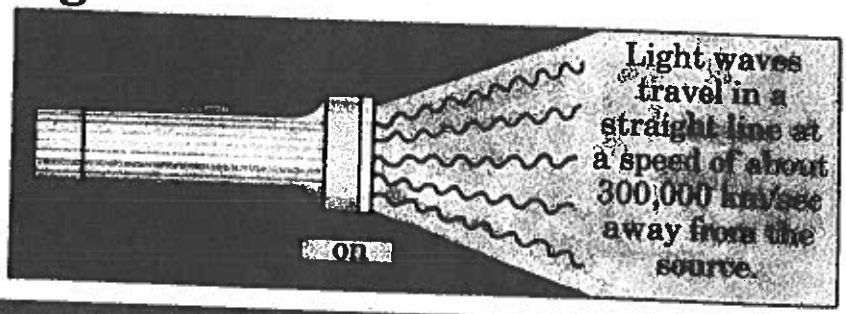
Quantum Theory of Light

Bundles of light energy, called **quanta,** travel in waves.

Parts of a Light Wave

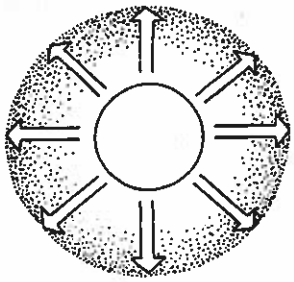


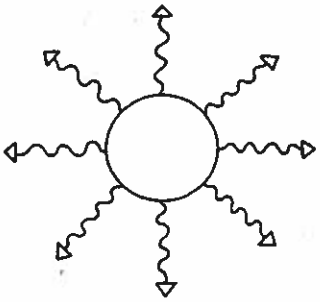
Speed and Movement of Light

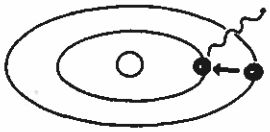


Light Waves

Theories of Light

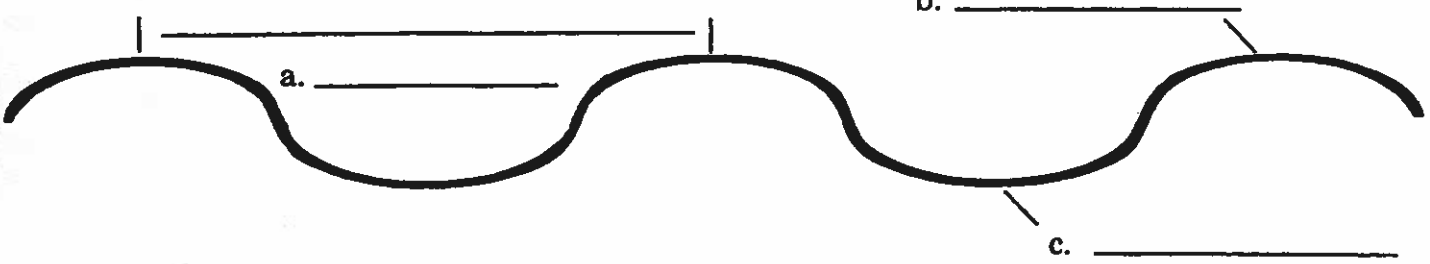




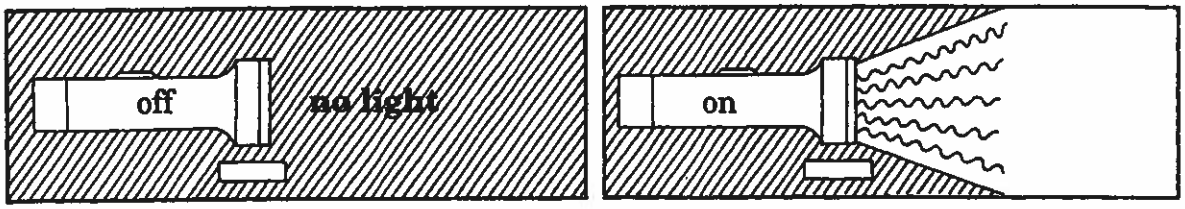


A. _____ B. _____ C. _____

Parts of a Light Wave



Speed and Movement of Light



1. Write the names of the theories of light on lines A through C above.
2. Label the parts of a light wave on lines a through c above.
3. Briefly explain the most modern theory of light. _____

_____

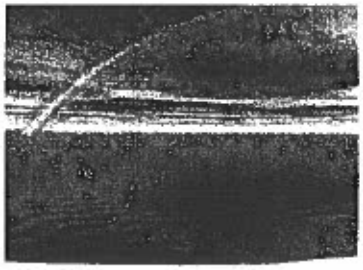
4. Which theory compares light movement to dropping a pebble into a pond? _____

_____

5. Write the word from Column B in the space before its description in Column A.

Column A	Column B
_____ a. the lowest depth of a wavelength	wavelength
_____ b. the number of waves per second	crest
_____ c. the distance between two waves	trough
_____ d. the highest point of a wave	frequency

6. The speed of light is about _____ kilometers per _____.
7. Light waves travel in _____ as they move away from the source.



Light and Colour

A beam of white light passing through a prism forms a spectrum of colour. The order of the colours of the spectrum from the longest wavelength to the shortest is red, orange, yellow, green blue, indigo, and violet.

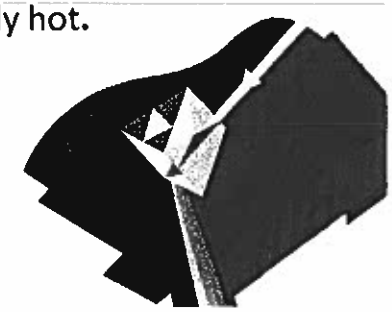
White light is really a mixture of many colours. These colours can be seen when a beam of sunlight passes at a slant through a glass ***prism***. The prism breaks up the white light into bands of coloured light called the ***spectrum.***

Seven coloured light in the spectrum are: ***violet, indigo, blue, green, yellow, orange and red***. Colours of the spectrum are seen in that order because our eyes see each wave length as a different colour. The prism refracts (or bends) the coloured lights in varying amounts; short waves are bent more than long waves. **Violet** light, with the shortest wavelength, is bent the most. **Red** light is the longest wavelength is bent the least.

Blue-colour material looks blue because of the chemical structure of that material absorbs all the coloured waves except blue, which is reflected and seen by the eye. **White-** coloured material appears white because it reflects all the coloured waves. **Black**-coloured material appears black because it absorbs all the colour waves and reflects none.

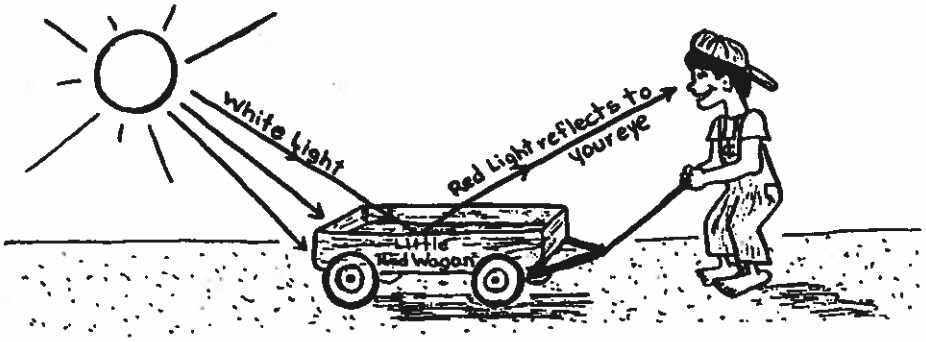
Dark colours absorb light energy and change it into heat. Therefore, darker clothes worn in winter help keep us warmer by holding or absorbing heat. Light colours worn in the summer help to keep us cooler because these colours reflect more light and absorb less energy.

Just think when you wear light white or black cotton t-shirts on a hot summer day for example. Why does it feel as though the white one is light and breathes? Light and heat reflect off the white surface almost repelling heat from the surface. Whereas black would absorb the heat and make a person feel really hot.



Color and Pigments

Mixing colored paints or crayon is *not* the same as mixing colored light. Paint contains pigments which are substances that absorb certain colors of light. For example, a red wagon has red pigment which absorbs all the colors of the spectrum - except red. The red light is reflected back to your eye.

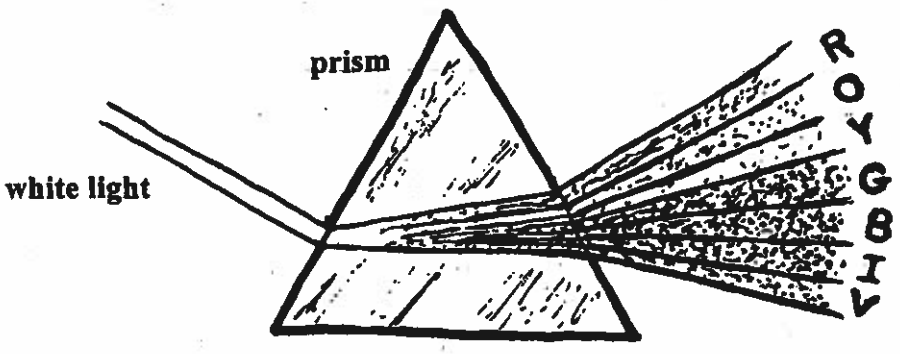


Black pigment absorbs all the colors and no light is reflected back to the eye. For this reason, objects that contain black pigment will heat up fast on sunny days since they absorb all the colors of white light.

White objects absorb little light and all the colors of the spectrum are reflected back to the eye.

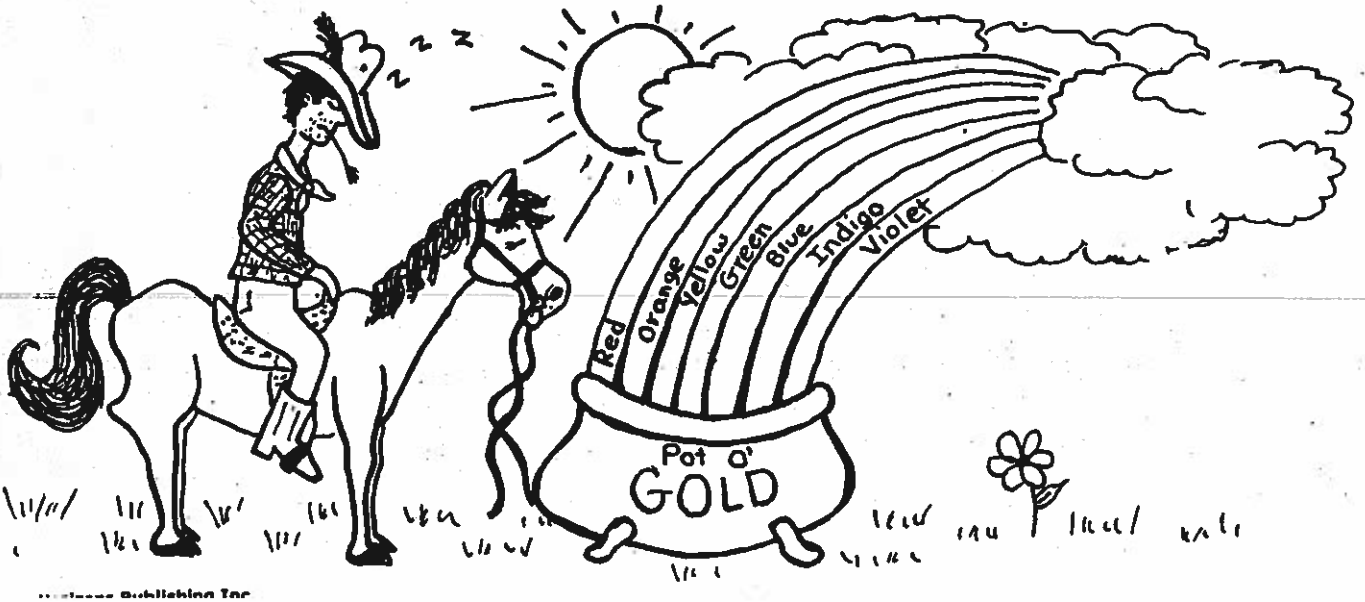
White Light

Sunlight and light from electric lightbulbs is called white light. However, when a narrow beam of sunlight (or white light) is passed through a triangle-shaped piece of glass called a prism, the white light will be split into the colors of the rainbow. If these colors are then combined again using a second prism, the result is white light. This tells us that white light is made up of all the colors of the rainbow.



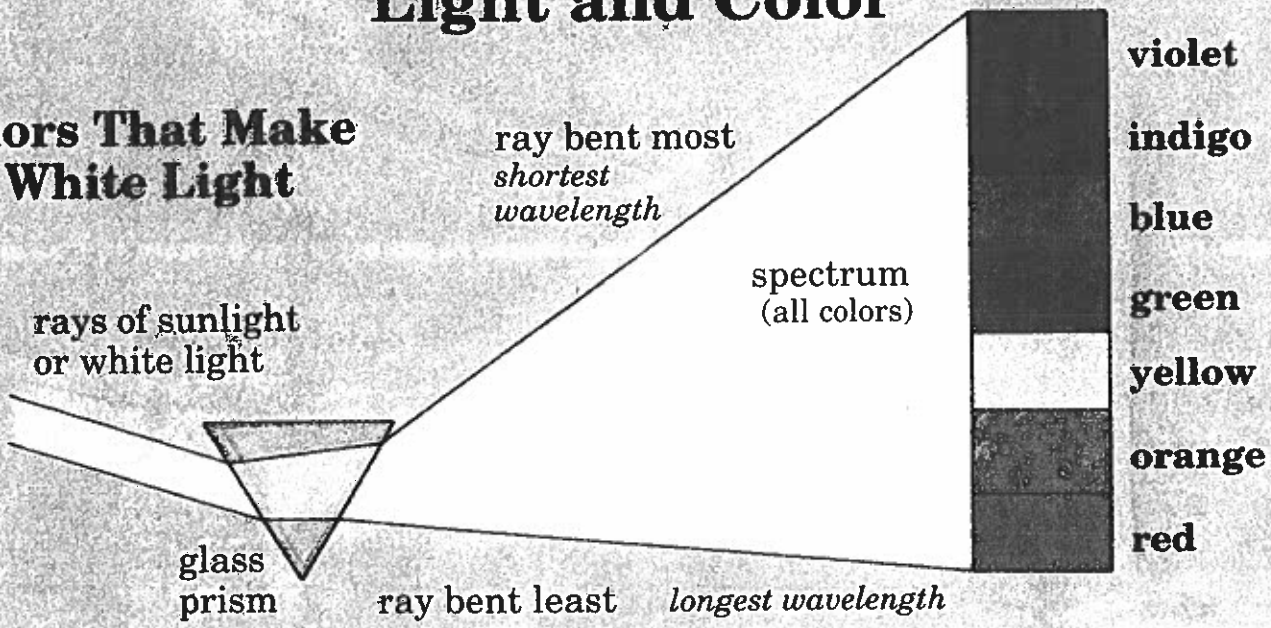
The Spectrum

The name for the colors of the rainbow is the spectrum. Remember the colors by using the name "ROY G. BIV".

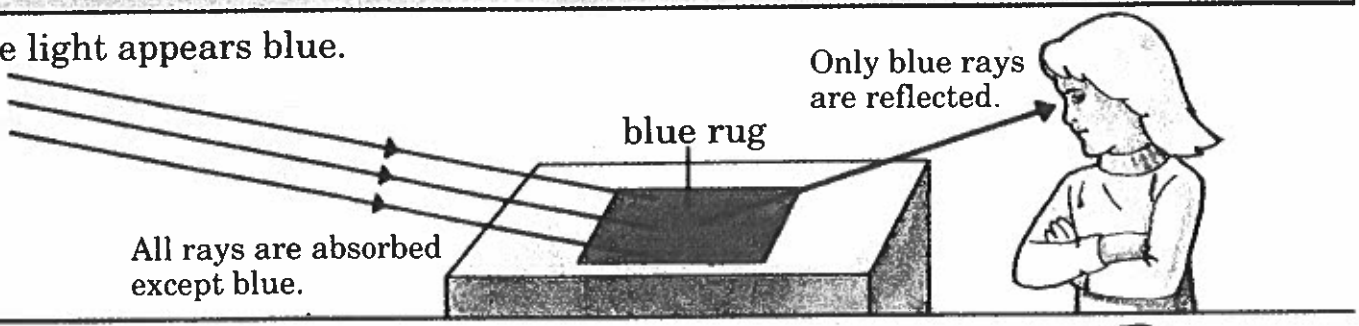


Light and Color

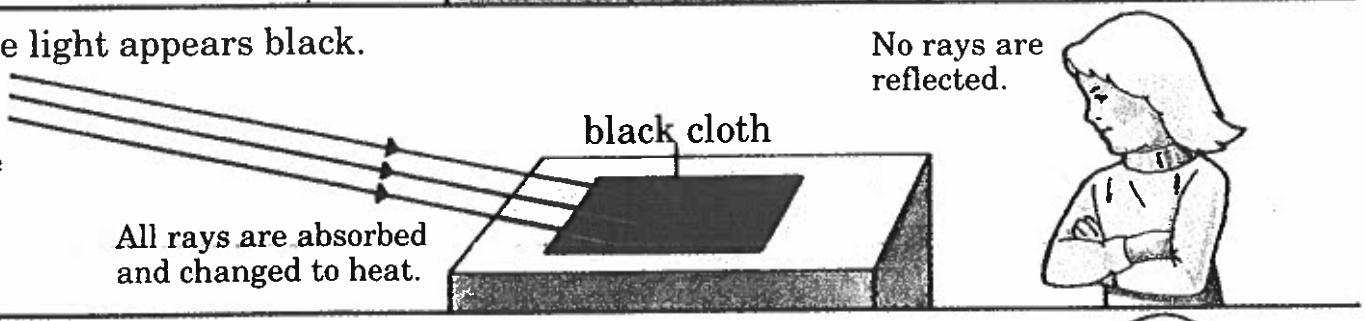
Colors That Make Up White Light



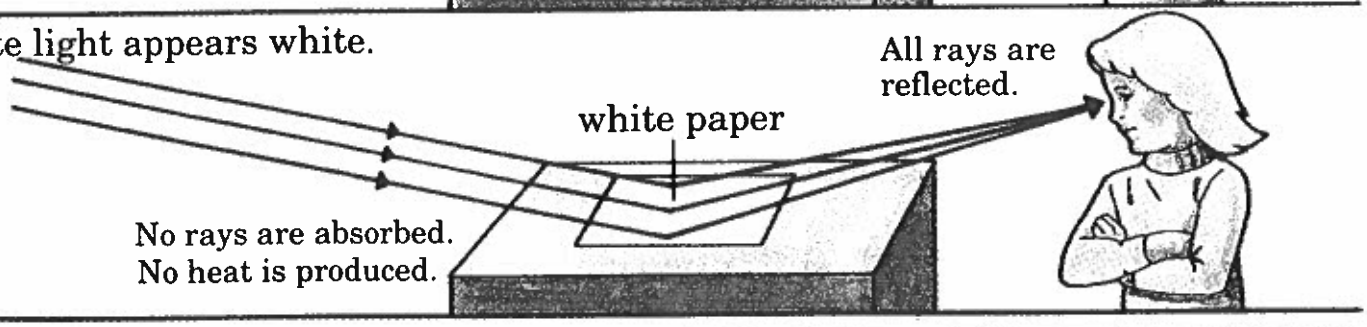
White light appears blue.



White light appears black.



White light appears white.



1. Name the colors of the spectrum, starting with the color that has the longest wavelength and ending with the color that has the shortest wavelength.
2. Why does a rose appear red to our eyes?

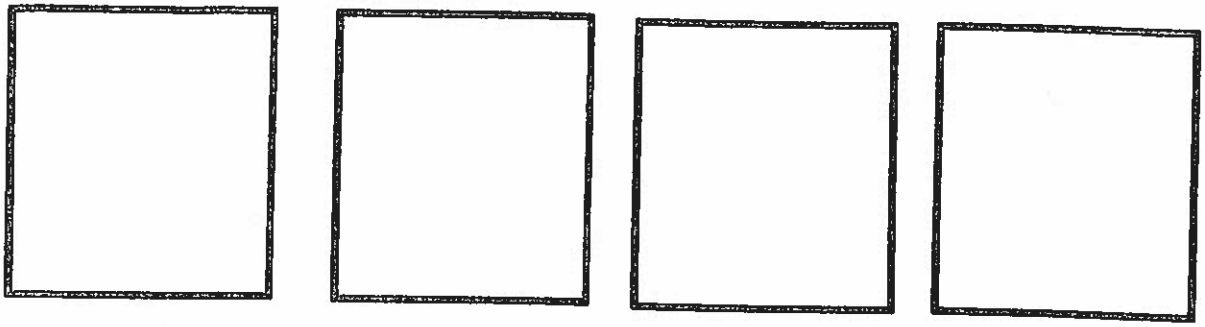
STUDY QUESTION: Why is outer space black?

ACTIVITY #7 - BLINDED BY THE LIGHT

Name: _____

Instructions

1) **Color the squares below with wax crayon or dark pencil crayon.**



RED **YELLOW** **BLACK** **WHITE**

2) **Leave the paper under a lightbulb or in a sunny window for fifteen minutes.**

3) **Which color feels the warmest?** _____

(The black square should be the warmest because it <u>absorbs</u> all the colors of light. The white square is cool because it <u>reflects</u> all the colors of light)

4) **Why is it not a good idea to leave a pet in a black car on a hot, sunny day?**

_____

_____

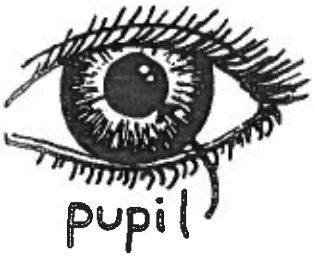
_____

5) **Why do people that live in hot, sunny desert areas often wear white clothes?**

_____

_____

_____



ACTIVITY #8 - PUPIL'S PUPILS

Name: _____

Instructions

1) **Draw your partner's eye very carefully in two different kinds of light. *Pay special attention to the black dot in the middle of the eye.* This black part is called the "pupil" and is really a hole that lets the proper amount of light into the eye.**

Classroom Lights Off (Dim Light)	**Classroom Lights On (Normal Light)**

2) **If you have been sitting in the dark for a while, what happens to the size of the pupil when the teacher suddenly turns on the lights?**

_____

3) **Explain why the pupil gets smaller when the lights are turned on.**

_____

_____

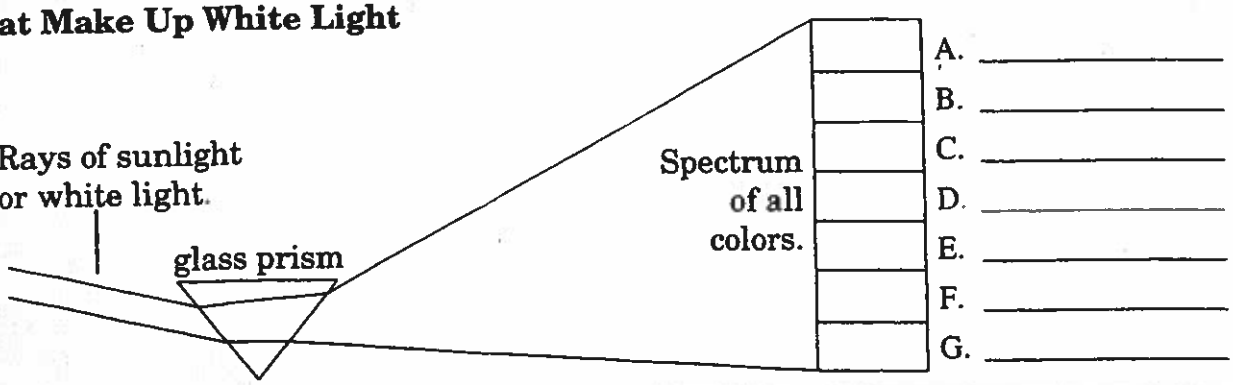
4) **When you first turn off the lights in your bedroom at night, it is very dark and you can't see anything. Why is it that after a few minutes, you can start to see some shapes in the room?**

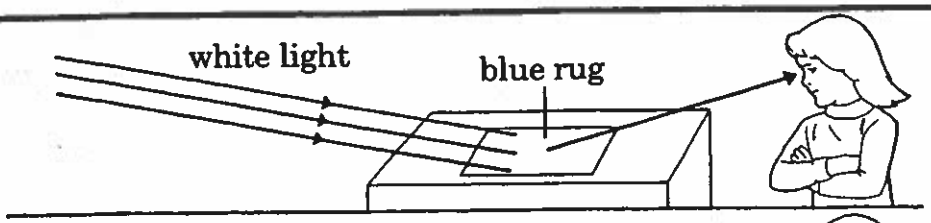
_____

_____

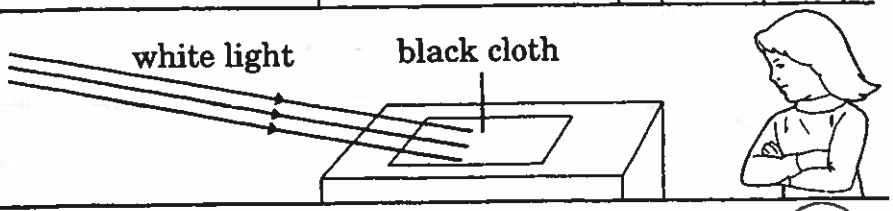
Light and Color

Colors That Make Up White Light

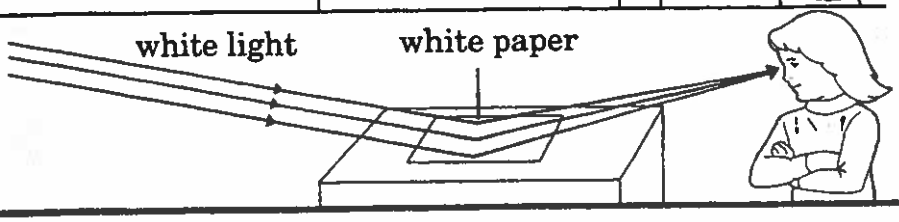




All rays are absorbed except blue.



No rays are reflected. All rays are absorbed and changed to heat.



All rays are reflected.

1. On lines A through G, name the colors of the spectrum, starting with the shortest wavelength and ending with the longest.
2. Use the first letter of each color, in ascending or descending order of the spectrum, to create a phrase that will help you to remember the correct order: for example, "Ralph only yelled 'Gosh!' because I veered."

_____

3. Write the word or words that will make each sentence a true statement.
   a. Short waves, such as the color _____ , are bent more than long waves.
   b. The color _____ has the longest wavelength.
   c. Another name often used for the spectrum is _____.
   d. If a rug absorbs all rays except _____ , it will appear blue.
4. Why does the spectrum appear as a band of colors?

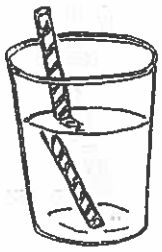
_____

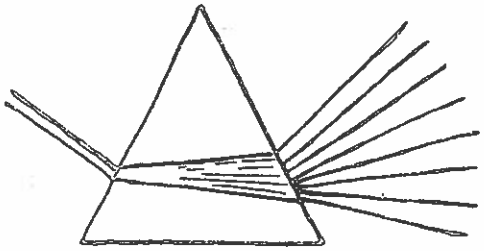
5. Why is a brown car in the sunshine hotter to the touch than a white car?

_____

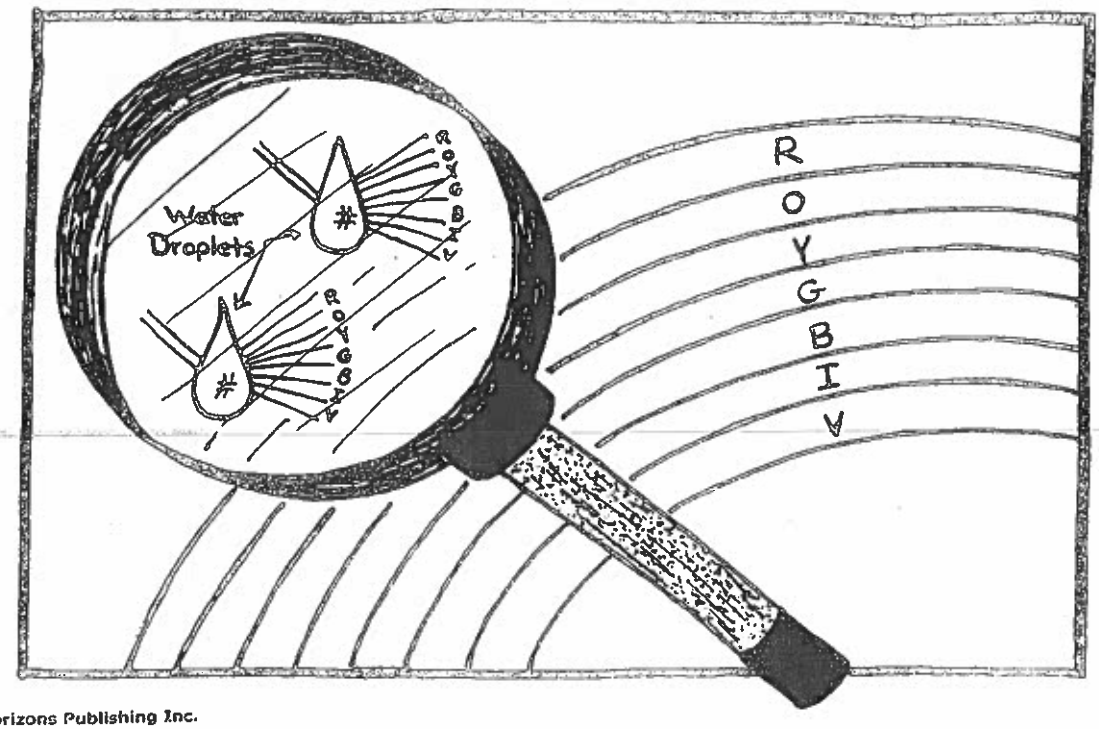
Refraction (Bending of Light)

Light travels in straight lines but it can be bent. When light passes from one transparent material to another type of transparent material, the light rays are bent. Bending of light rays is called refraction. A prism is a good example of refraction as light rays are bent when they go from air to glass.



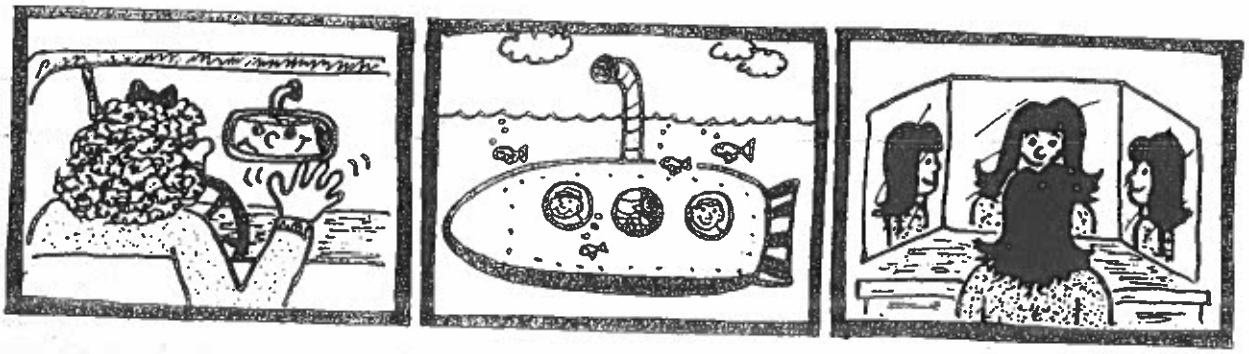


A rainbow is another example of refraction and the bending of light. White light from the sun passes through droplets of water in the air. This white light is bent (refracted) by the water droplets and separates into the colors of the raimbow, just like a prism.



Reflection

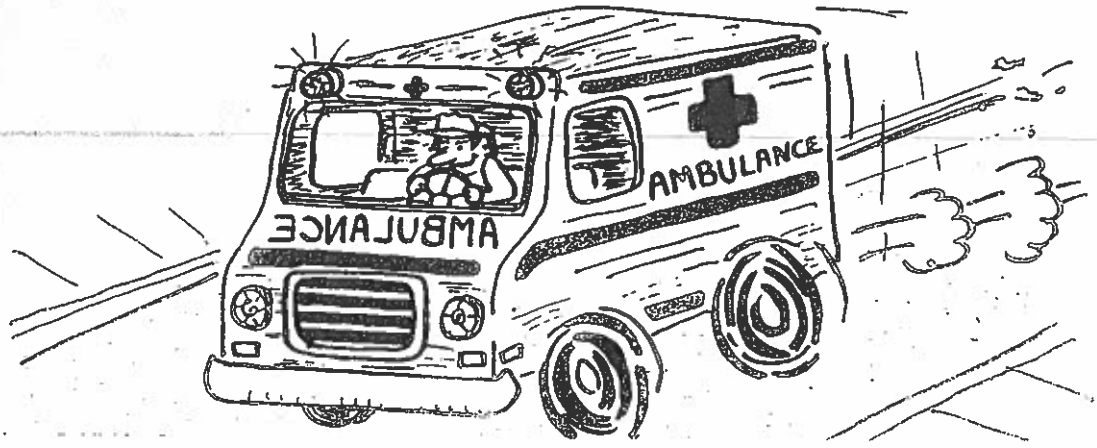
Light travels in straight lines but it can be made to turn a corner - reflection. Special types of materials that are shiny will cause light to change its direction and reflect. Mirrors are made by painting a piece of glass on one side with a shiny coating that reflects. Reflection of light is used for rearview mirrors in cars, periscopes in submarines and bathroom mirrors to help comb your hair in the morning.



Reversed Images

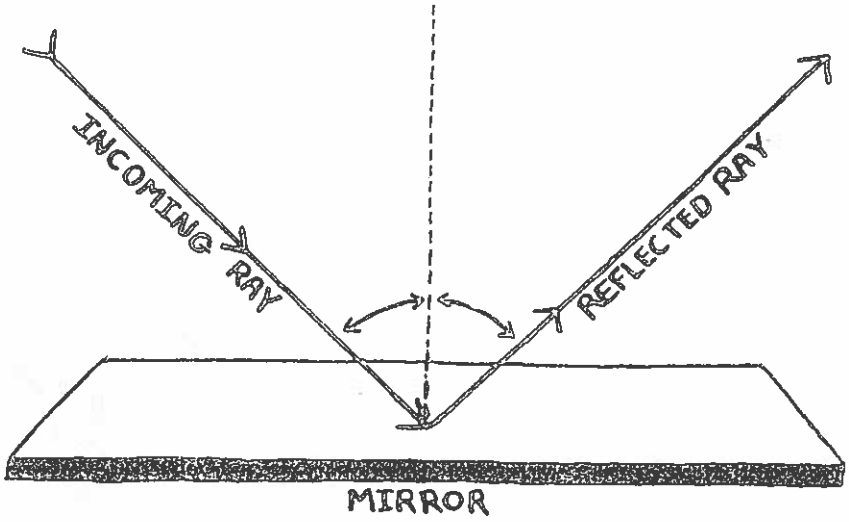
When light reflects, everything is the same except for one thing - right and left are reversed. This reversal of right and left makes it very hard to read handwriting that is held in front of a mirror.

An ambulance will often have reversed writing on the front so that drivers will be able to see the word "ambulance" correctly when they look in their rearview mirrors.

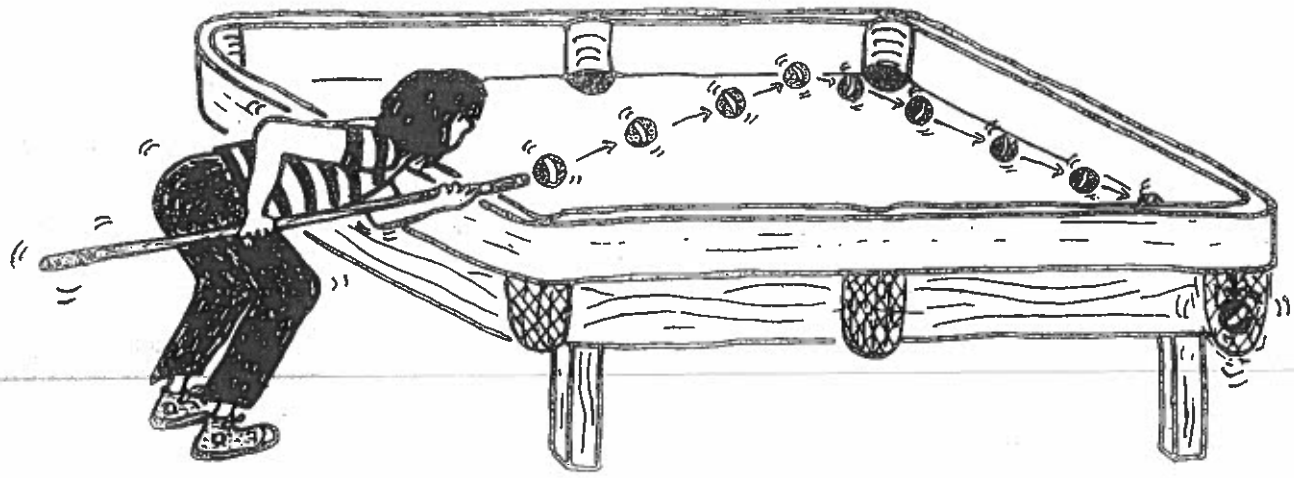


Law of Reflection

The law of reflection says that light will reflect off a mirror at the same angle that it came to the mirror.



The law of reflection it not just for light. This also holds true for other things like bank shots in pool.



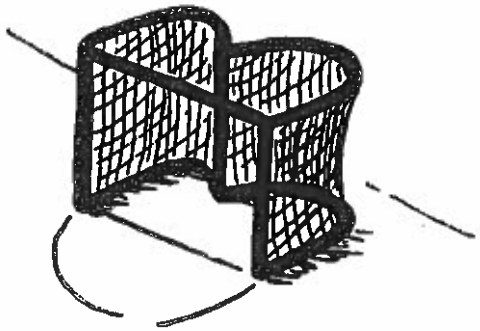
ACTIVITY #4 - THE AMAZING MIRROR HOCKEY SHOOTOUT

Name: _____

PART 1 - HOCKEY SHOOTOUT

1) **Tape this worksheet to a desk or table so it will not slide around.**

2) **Your partner holds the mirror while you try to score a goal by drawing a straight line from the puck to the empty net. The partner also holds a piece of paper over your hand so you *can only see the reflection of your hand in the mirror*. When you are finished, switch with your partner.**



PART 2 - CAT AND DOG

1) With the same set-up as PART 1, try to trace the simple words "CAT" and "DOG" with your pencil. (Remember to look at the reflection of your hand in the mirror)

PART 3 - PRINT YOUR NAME

1) **Looking at the reflection of your hand in the mirror, try to print your name on the line so that it looks correct in the mirror.**

ACTIVITY #6 - REFRACTION AND BENDING LIGHT

Name: _____

PART 1 - THE BENT PENCIL

1) **Fill a babyfood jar or beaker half full with water and put a pencil into it.**

2) **Look at the jar from the side and draw what you see.**

PART 2 - BABYFOOD JAR MAGNIFYING GLASS

1) **Fill a babyfood jar with water and put the lid back on.**

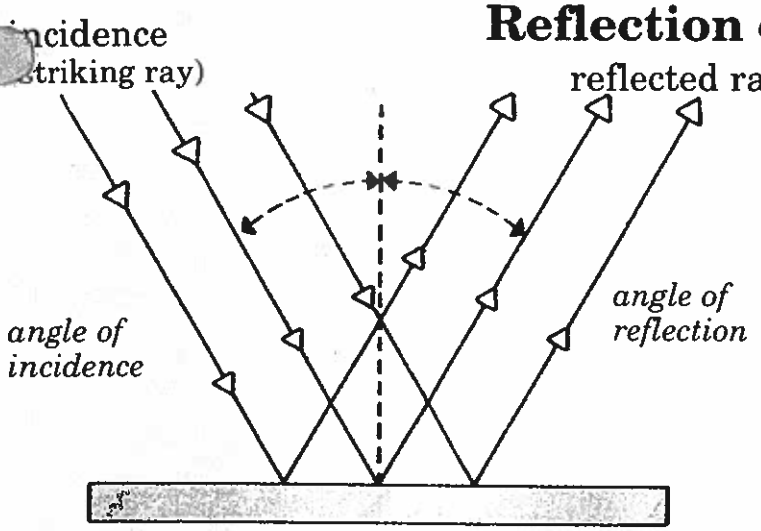
2) **Put the babyfood jar on its side and use it to magnify the small dinosaur picture below. Draw the enlarged dinosaur in the box.**

Question: In this experiment, the water is refracting (bending) the light like the lens in a magnifying glass. List two other places where lenses are used to bend light.

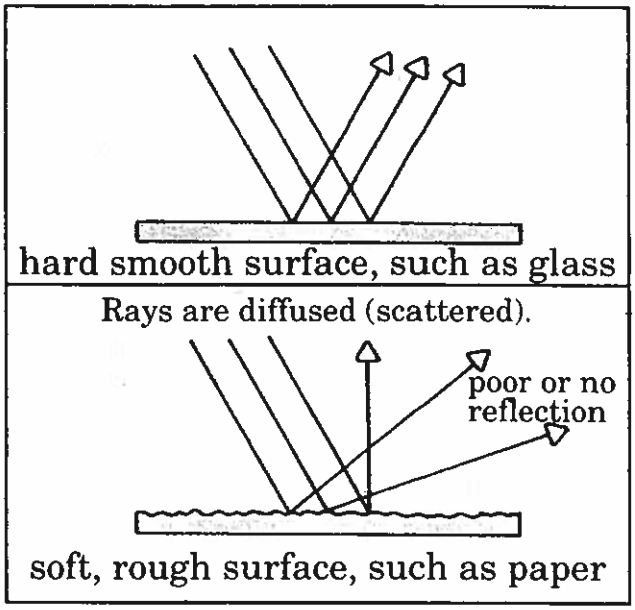
1) _____ 2) _____

Reflection and Refraction

Reflection of Light

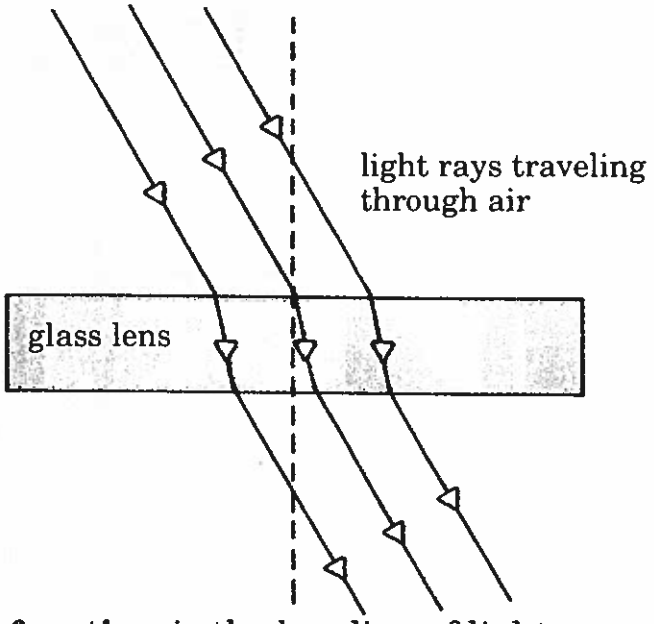


The **Law of Reflection** says that the angle of incidence is equal to the angle of reflection.



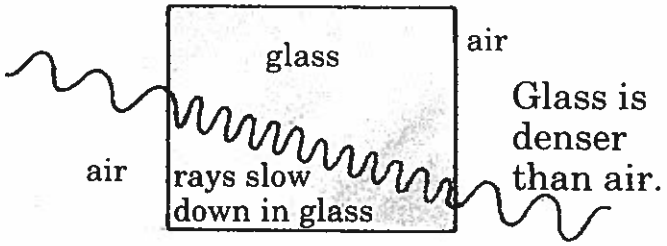
Refraction of Light

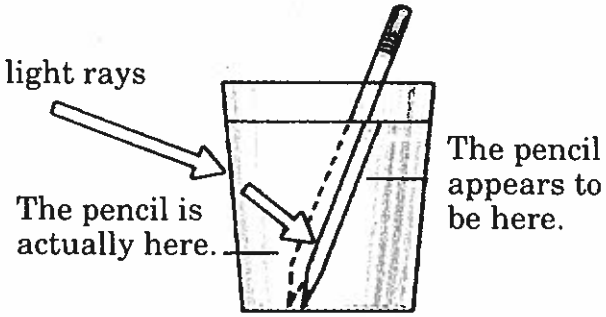
Light rays bend as they pass through a glass lens.



Refraction is the bending of light rays.

Depending on the density of the transparent material, the speed of light will change, causing refraction.



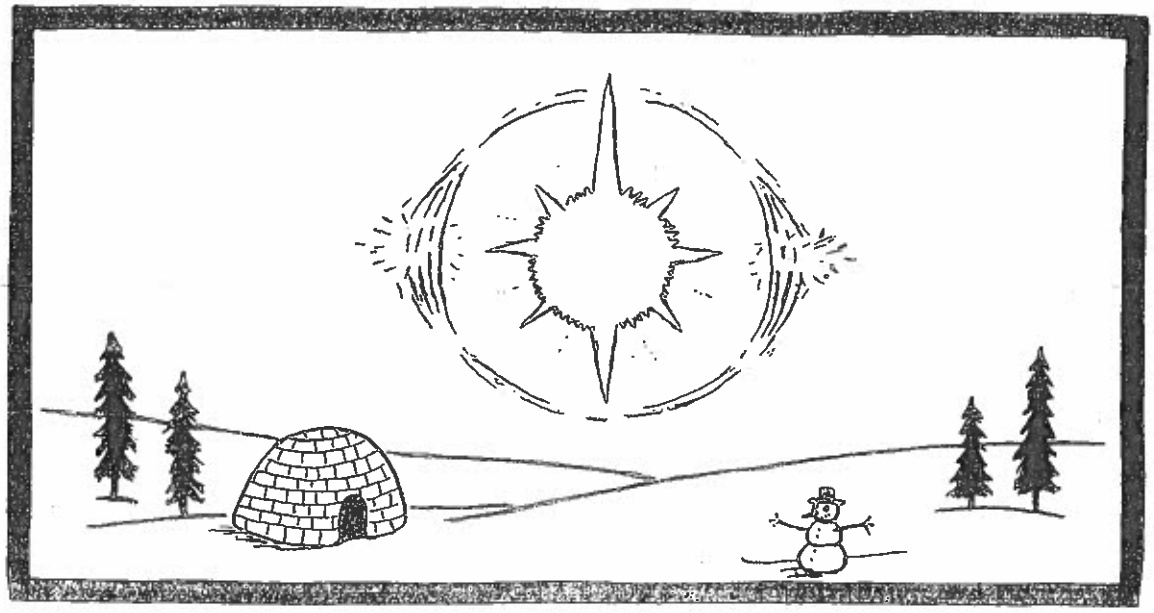


An Example of Refraction

1. Why might there be no reflection from a rough surface?
2. What causes refraction?

STUDY QUESTION: What causes mirages?

"Sundogs" are small rainbows found on either side of the sun that sometimes form during the winter in extremely northern climates. Ice crystals can act like water droplets separating the light into the colors of the spectrum. Instead of a rainbow, you could call a sundog an "icebow".



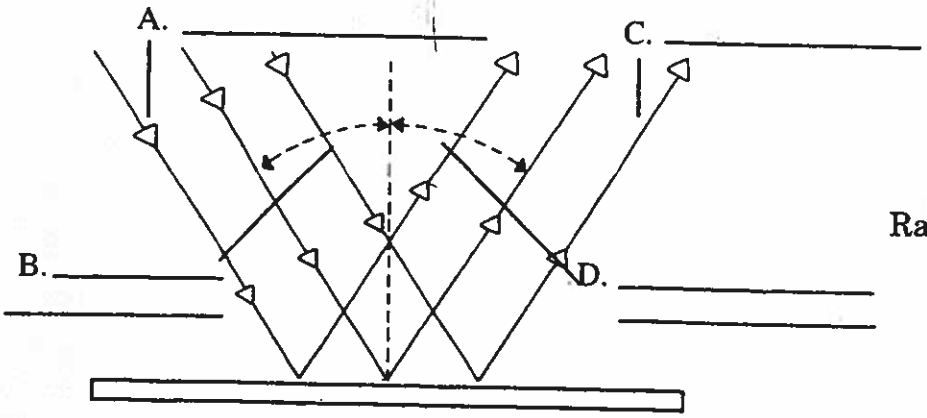
Questions (Answer In Full Sentences - A.I.F.S.)

1) How is a rainbow similar to a prism?

2) Why are there not usually rainbows on overcast days?

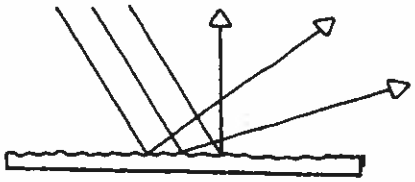
Reflection and Refraction

Reflection of Light



Surface Reflections

Rays are diffused (scattered); poor or no reflection

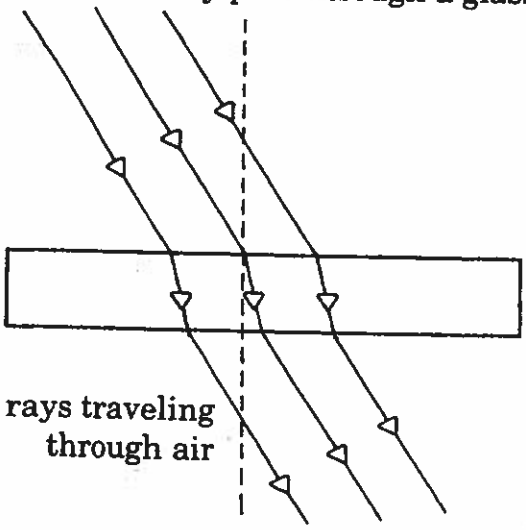


soft, rough surface such as paper

Refraction of Light

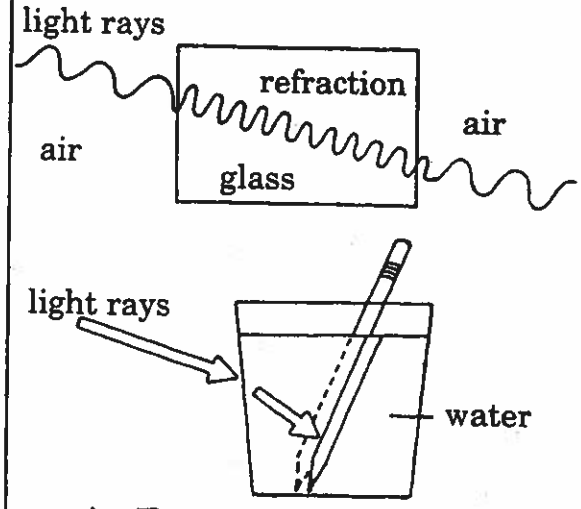
Refraction is the bending of light rays.

Light rays bend as they pass through a glass lens.



Density and Refraction

Rays slow down in glass.
Glass is denser than air.



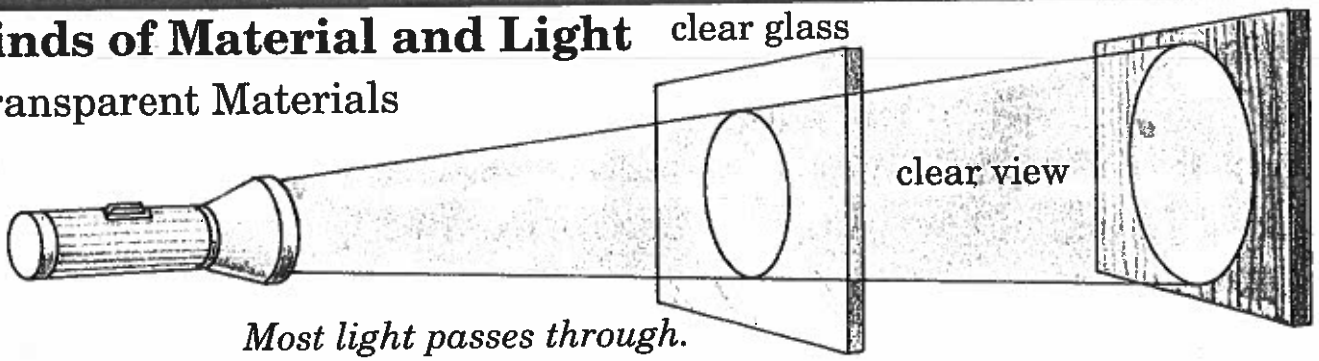
An Example of Refraction

1. Label the parts of reflected light on lines A through D above.
2. What two things are necessary to produce a reflection? _____
3. Light rays are reflected from the _____ of an object.
4. The law of _____ can be applied to smooth surfaces but not to rough ones.
5. A light ray *(speeds up, slows down)* when it passes into a denser material.
6. Why do objects that lie half in and half out of water appear distorted? _____

Light and Materials

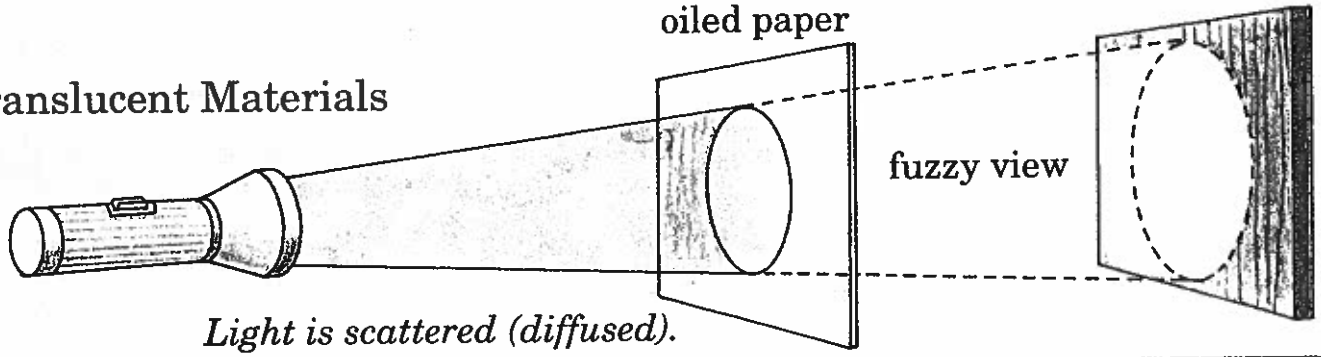
Kinds of Material and Light

Transparent Materials



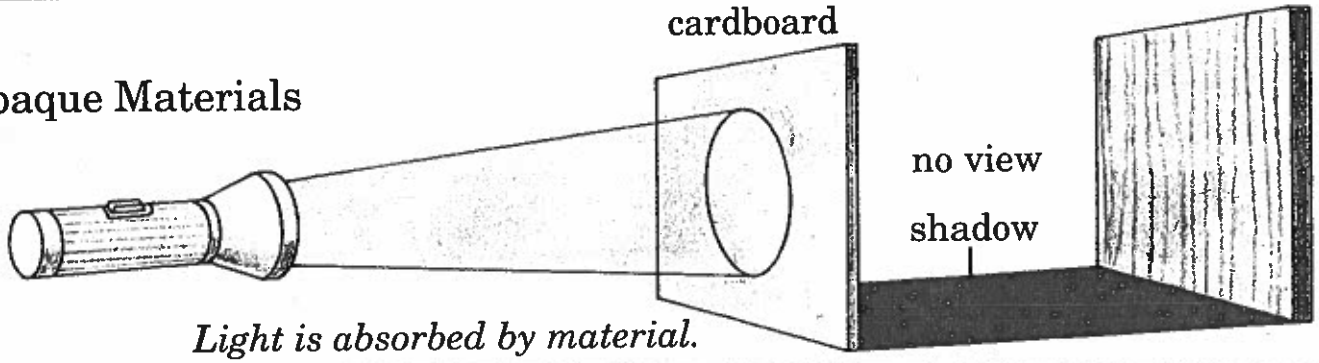
Most light passes through.

Translucent Materials



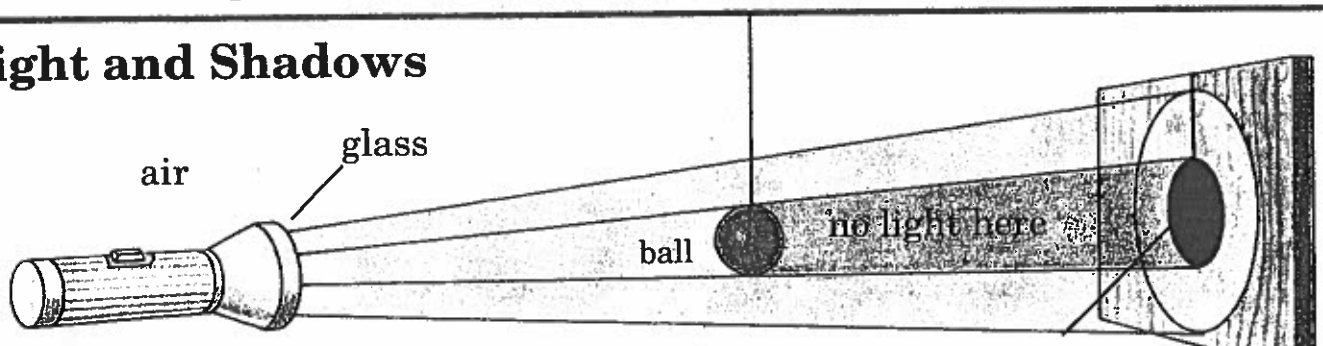
Light is scattered (diffused).

Opaque Materials



Light is absorbed by material.

Light and Shadows



Light travels in a straight line, creating shadows.

1. Which type of material allows a person looking through to see objects on the other side most clearly?
2. What causes a shadow?

STUDY QUESTION: Find out about the umbra and penumbra parts of a shadow.

Properties of Light

Light is invisible when it travels. A person will not see light until it hits something. Light also travels in straight lines. It can go through objects or it can be stopped but it will not go around. If light is blocked, a shadow will form behind the object where there is no light.

Transparent

Objects that let all the light through are transparent. (see-through)

Examples include:

1) _____

2) _____

3) _____

Translucent

Objects that let only some of the light through are translucent.

Examples include:

1) _____

2) _____

3) _____

Opaque

Objects that do not let any light through are opaque.

Examples include:

1) _____

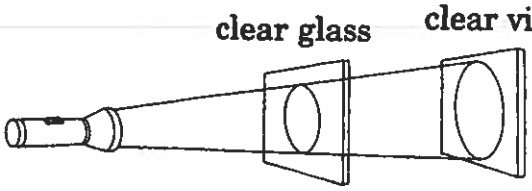
2) _____

3) _____

Put each under the correct heading above: glass, cardboard, wax paper, plexiglass, aluminum foil, dirty water, air, frosted glass.

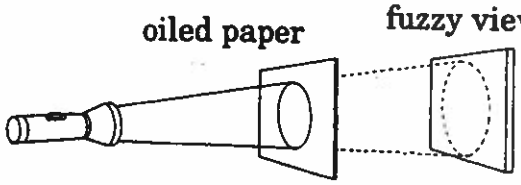
Light and Materials

Kinds of Materials and Light



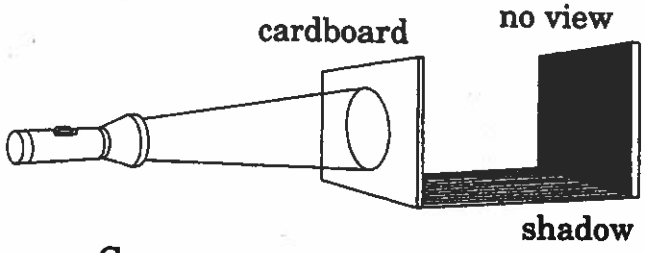
A. _____

a. _____



B. _____

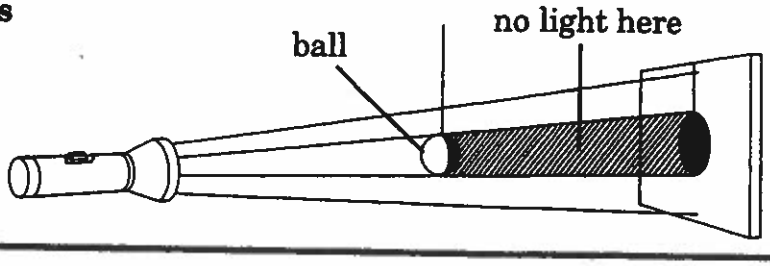
b. _____



C. _____

c. _____

Light and Shadows



1. On lines A through C, name the type of material pictured.
2. On lines a through c, briefly describe what happens to the light when it hits that material.
3. Use the letters TP, TL, and OP to identify these materials as transparent, translucent, or opaque.

a. water _____	d. air _____	g. concrete _____
b. frosted glass _____	e. aluminum foil _____	h. plastic wrap _____
c. wax paper _____	f. orange juice _____	i. tissue paper _____

4. Write the word or phrase from Column B in the space before its description in Column A.

Column A	Column B
_____ a. produces a shadow	transparent object
_____ b. transmits light rays	opaque object
_____ c. area of darkness	translucent object
_____ d. scatters light rays	shadow

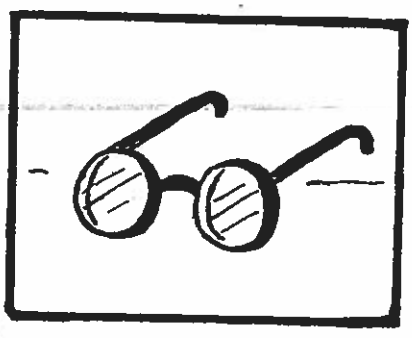
5. What is a shadow? _____

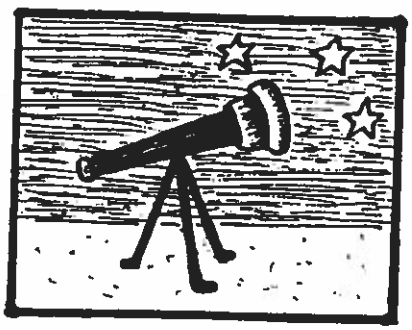
_____

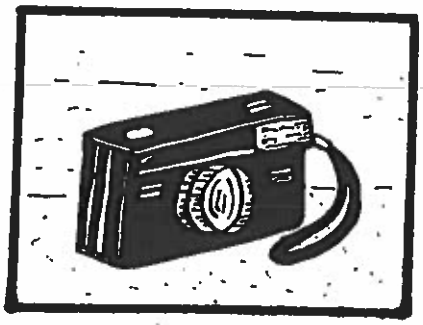
Lenses

A lens is a curved pieces of glass that bends light in ways that help us. A magnifying glass bends light to make small objects look larger.

Lenses are also used in microscopes, cameras, telescopes, contact lenses and glasses. (glasses to help people see better, not for holding pop or Kool-Aid)

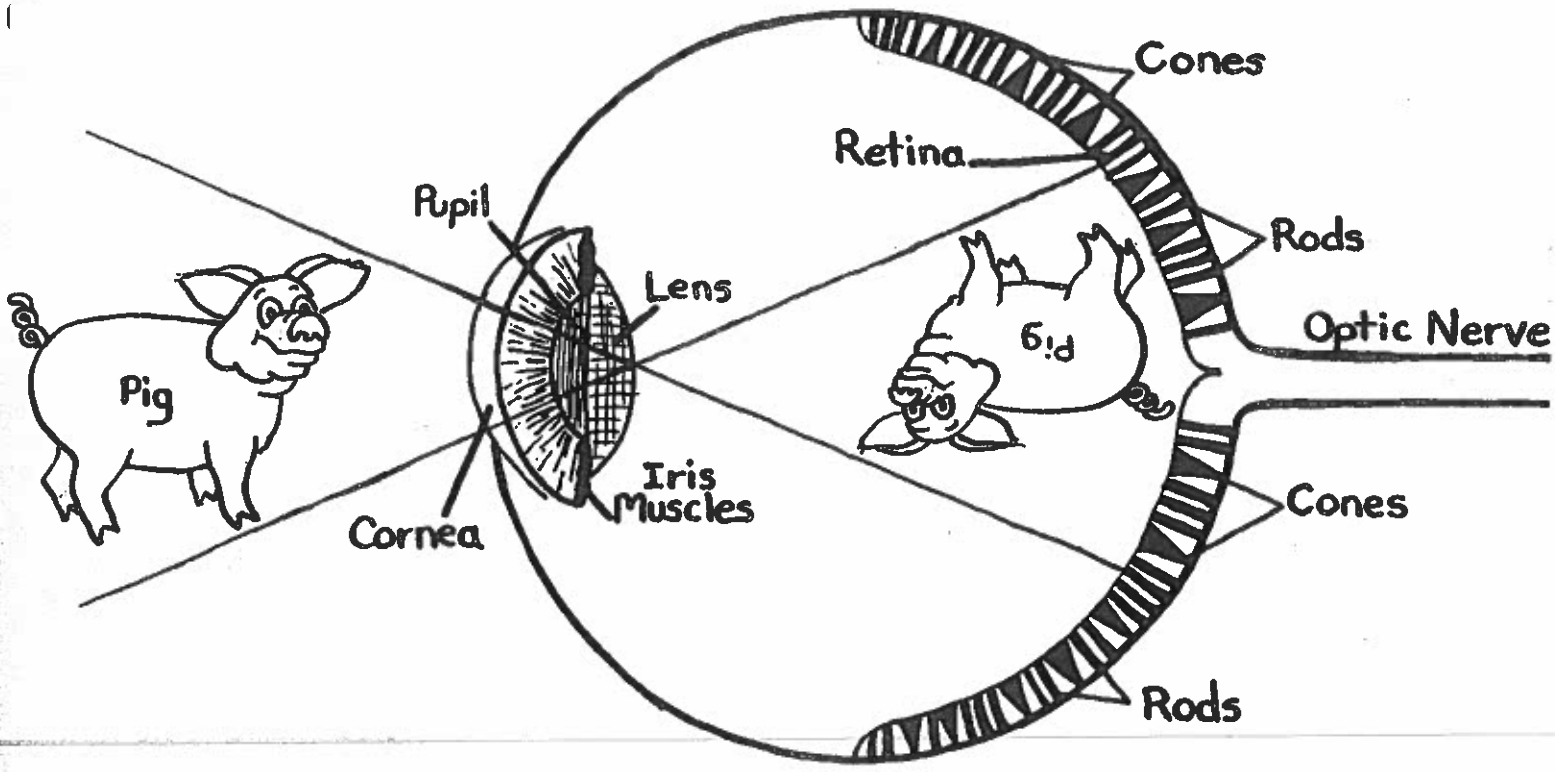






The Eye

Light passes through the protective cornea and enters the eye through the pupil. The iris is a set of muscles that controls the size of the pupil and how much light to let in. Then, light goes through the lens which bends the light and focuses it upside-down on the retina which acts like a screen. Special cells on the retina called rods and cones send out signals when they are hit by light. These signals are sent from the eye to the brain along the optic nerve. Every eye has a blind spot where the optic nerve connects to the retina. This happens because there are no rods or cones where the optic nerve joins to the retina.



cornea	-	a transparent (see-through) cover that protects the eye
pupil	-	a "hole" in the eye that lets light into the eye (the black part at the center of the eye)
	-	gets smaller in bright light and gets bigger (dilates) in the dark to let more light in
iris	-	a set of muscles on the edge of the pupil that control the size of the pupil
lens	-	bends the light and focuses light on the retina at the back of the eye
retina	-	acts like a screen and contains many cells which react to light (cones and rods)
optic nerve	-	sends messages from the cells in the retina to the brain
cones	-	cells in the retina that can see color
	-	cones are used mainly in the day
rods	-	cells in the retina that see light and dark but not color
	-	rods are used mainly at night

Name _____

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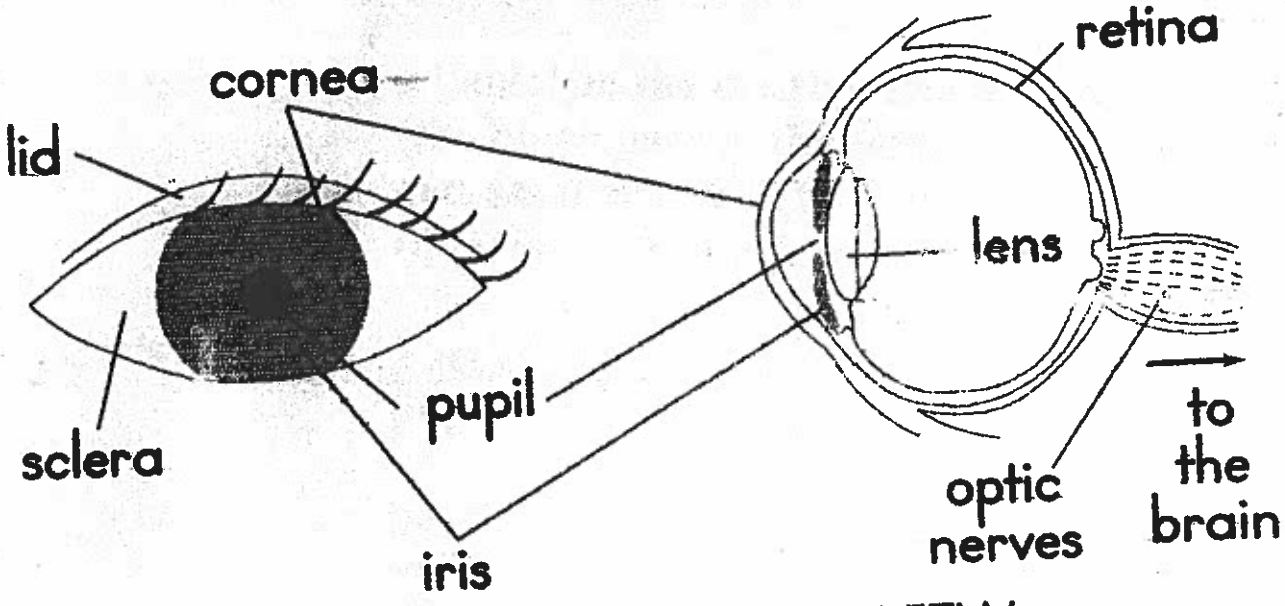
Sense of Sight



THE FIVE SENSES SHEETS, 002

The sense of sight is the most complex of the five senses. When we see an object, we are actually seeing beams of light that are bouncing off the object. The light enters the eye through the cornea (the transparent covering) and goes through the pupil (the dark circle in the center of the eye). It then passes through the lens and is projected onto the retina. From there the information is sent to the brain, which tells us what we are seeing.

SKILL: SIGHT/DIAGRAM OF THE EYE

ACTIVITY #9 - MAKE YOUR HOMEWORK DISAPPEAR

Name: _____

Instructions

1) **This student is sad because there is too much homework (as usual). You can help by making the homework disappear.**

2) **Hold this paper in front of you at arm's length and close your left eye.**

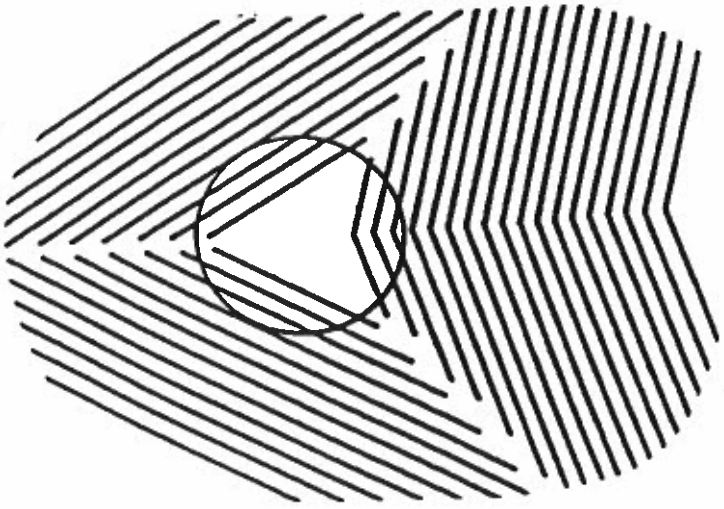
3) **Stare at the student and slowly bring the page closer to your face. (*Keep staring at the student*)**

4) **The homework should disappear when the paper is about 8 inches from your face. You have found your "blind spot".**

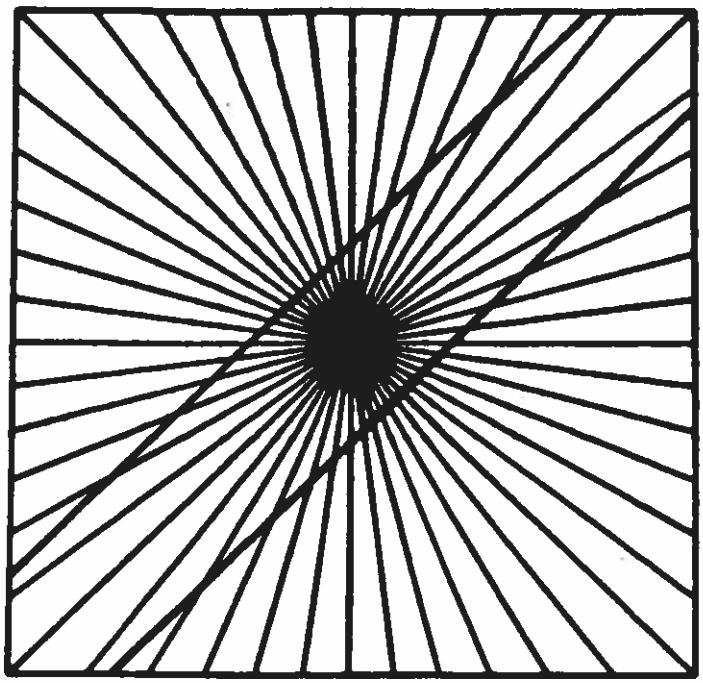
Explanation of Blindspots

At the back of each eye there is a nerve called the optic nerve that carries signals from the eye to your brain - sort of like a T.V. cable. The only problem is that where the optic nerve connects to the eye, the eye can't see. This is the blind spot.

IS THIS CIRCLE ROUND?



ARE THESE RAILWAY TRACKS PARALLEL OR WILL THERE BE A TRAIN DERAILMENT?



THE IMPOSSIBLE BOX

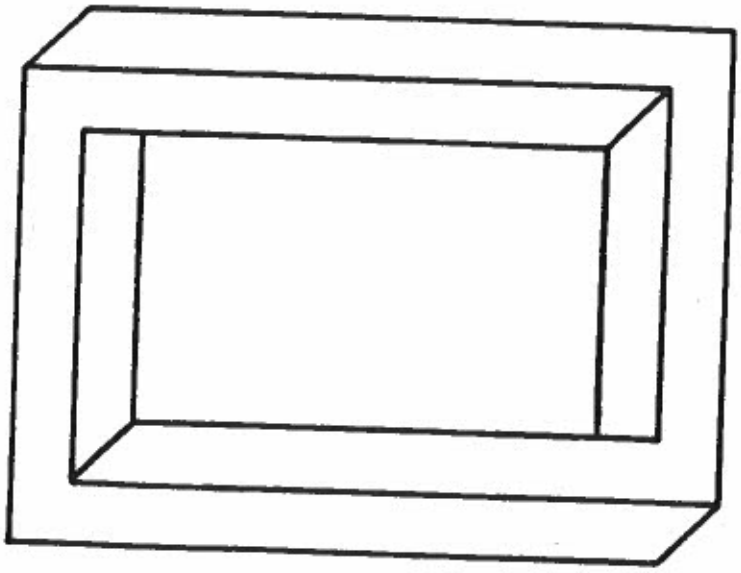
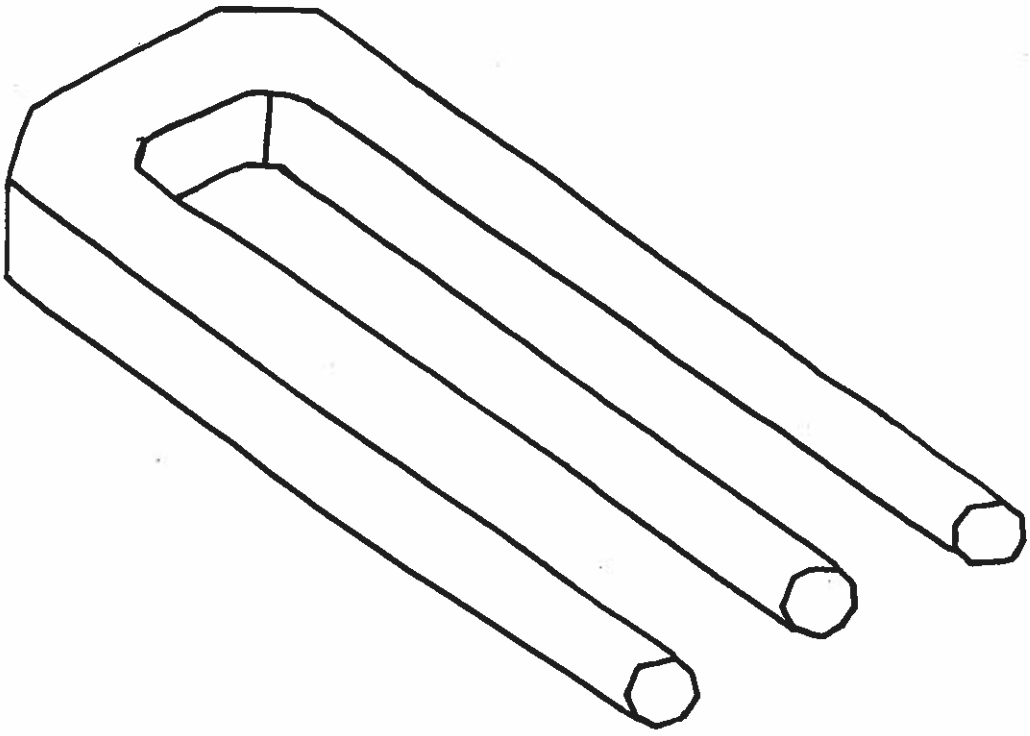
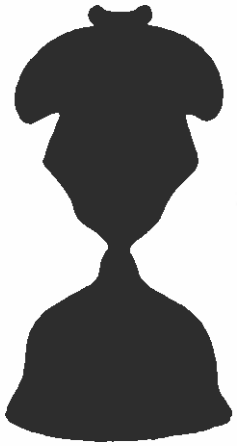


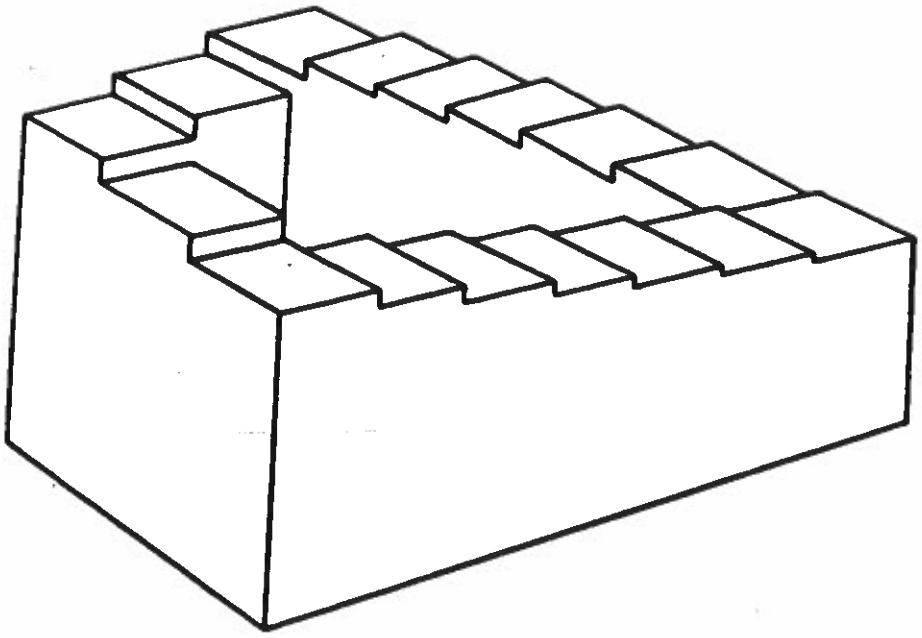
FIGURE THIS OUT!



A FANCY LAMP OR TWO CATS ABOUT TO RUB NOSES?



THE IMPOSSIBLE STAIRCASE - IT JUST KEEPS GOING AND GOING AND GOING...



HOW OLD IS THE WOMAN IN THIS PICTURE?

21 40 83

ACTIVITY #1 - WORDSEARCH

Name: _____

Find These Words:

LUMINOUS
ILLUMINATED
SHADOW
TRANSPARENT
TRANSLUCENT
OPAQUE
PRISM
WHITE LIGHT
SPECTRUM
BLIND SPOT
ROYGBIV
MAGNIFYING GLASS
PIGMENT
REFLECTION
REFRACTION
MIRROR
PERISCOPE
RAINBOW
SUNDOG
LENS
COLOUR
CORNEA
PUPIL
IRIS
RETINA
RODS
CONES
OPTIC NERVE

C I O K L T A P Z Z A S A N S T D F Z W S
D A P I G M E N T Y K C J U G A I B J G T
R N T T R V Y L V C W J O T A Q F R T N F
G W I J K I M I L B H N O Z Q W U R E B H
Q B C L O U S I R A I N B O W O I C C I X
P R N O L F P I X M T M J C L B U E L E T
L E E K K U K H U H E I U O T L A O F U D
R F R F P R M L F Y L R C R S I J F I J B
R L V I R W Y I F J I R Z N D N A I T K L
O E E I S A A R N T G O A E Z D S B J U V
D C T M S C C C X A H R Z A S S H S Z V M
S T K I U K O T G A T R A N S P A R E N T
G I F S N E P P I W Y E E Z P O D O O B E
W O V C D A A R E O J L D V E T O Y U V R
R N H N O U Q I A W N L N V C V W G E B E
J F Y Q G N U S X U P B Q X T F J B X L Z
Q K E A H C E M G P O S U F R R O I X Z Q
K R Q C S P X S C Y C S M Z U T W V D C K
F L E N N H A U Z L B K M N M X O J S A Y