Visible Light: Opaque, Transparent and Translucent

Overview:
The student will show that s/he is able to investigate and understand the basic characteristics of visible light and how it behaves while focusing on opaque, transparent, and translucent.

Procedure:

1. To instruct the student on information regarding this topic, the teacher will use the *+MIND notes Light* for the student to be able to take notes by writing in information or using the cut and paste option. Although these notes encompass all of the bullets for the ASOL, this allows students to learn the basic characteristics of visible light.
2. Using the *Other Sources of Light Waves* (supplied) have the student investigate new information that s/he might not have been taught. Provide the student with numerous opportunities to show how s/he investigated, such as:
    a. Student will investigate by going to the library and finding facts in books.
        i. Write the facts learned.
        ii. Type two new facts with or without the support of *Co:Writer* or *ReadandWrite*.
        iii. Video tape themselves doing the investigation and record new facts learned while investigating.
            1. Make sure if this is being used for ASOL documentation that a dialogue of the video is written out and submitted with the video.
    b. Using the Internet, the student will investigate by finding videos, games, and other interactive Web pages to learn new information.
        i. The student can take images of the new facts and embed them into a SMARTnotebook file.
    c. Find 5 videos on YouTube that other students could watch to learn more about visible, opaque, transparent, or translucent light.
    d. Watch Discovery Education Videos and take down new facts learned.
    e. Explore with prisms, opaque, transparent, and translucent objects to learn common items that fit into these categories.
3. Once the student has shown the basic understanding of visible light, have the student do the practice questions.
4. Student makes
    a. *Foldable* for opaque, transparent, and translucent in a group or independently.
    b. *Visible Spectrum*.
5. When the student is ready to be assessed, s/he can complete the following:
    a. *Quiz - Vocab* - opaque, transparent, and translucent
        i. This assessment show only knowledge of the stem of the ASOL.
    b. Test - Light
        i. This assessment tests for understand basic characteristics of visible light and how it behaves along with opaque, transparent, and translucent

ASOL Covered:

5S-FME 4c (SOL 5.3) The student will investigate and understand basic characteristics of visible light and how it behaves. Key concepts include:

c) opaque, transparent, and translucent

5S-SI 1b (SOL 4.1) The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which objects or events are classified or arranged according to characteristics or properties.

5S-SI 2i (SOL 5.1) The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which inferences are made and conclusions are drawn.

8S-SI 3l (SOL PS.1)) The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which experimental results are presented in appropriate written form.

Materials Needed: *MIND Notes - Light*, *Other Sources for Light Waves*, *Foldable - Vocab - opaque, transparent, and translucent*, *Make your own visible spectrum*, *Quiz - Vocab - opaque, transparent, and translucent*, *Test - Light*, glue, scissors, crayons, pencil/markers, sentence strip or long piece of paper, computer/iPad for Discovery Education Videos and Tar Heel Reader books, iPad (if using the video component), camera (if wanting to video or take pictures during the investigation), *Co:Writer* (if using for writing)

Instructional Setting: The instruction setting could be in a resource setting, general education setting, or self-contained. This scientific investigation ASOL is in line with the SOL 5.3, therefore the parts of this unit are appropriate activities for any 5th grade student.

Community Connections and/or Peer Interaction: With the 5S-FME 4c ASOL being a 5.3 SOL, this could be an opportunity to include students in the general education setting or to provide specialized instruction in a small group setting. *If this ASOL is being used as an assessment for the VAAP portfolio, the student will need to complete the activity independently.

Functional Activity/Routine:

Some skills that are incorporated into this activity/routine:

1. For the investigation piece, the student can use technology to enhance the investigation part.
2. Student is learning to plan and gather materials for a desired activity.
3. Student is working on skills that promote independence.
4. Following along and taking notes is a lifelong still whether the student is typing or physically writing notes.
5. This ASOL is one that could be embedded into the general education setting. Having the students to be with their peers and function with same age peers allows for social skills to be addressed.

Strategies to Collect Evidence:

- Ways to show investigation:
    - Investigate by going to the library and finding facts in books.
        - Write the facts they learn.
        - Type two new facts with or without the support of *Co:Writer* or *ReadandWrite*.
        - Videotape them doing the investigation and record new facts that they learn while investigating.
            - Make sure if this is being used for ASOL documentation that a dialogue of the video is written out and submitted with the video.
    - Using the Internet, the student will investigate by finding videos, games, and other interactive Web pages to learn new information.
        - The student can take images of the new facts and embed them into a SMARTnotebook file.
    - Find 5 videos on YouTube that other students could watch to learn more about visible, opaque, transparent, or translucent light.
    - Watch Discovery Education Videos and take down new facts learned.
    - Explore with prisms, opaque, transparent, and translucent objects to learn common items that fit into these categories.

- Ways to show basic understanding of visible light and how it behaves including the key concepts of opaque, transparent, and translucent
    - *Quiz - Vocab - opaque, transparent, and translucent*
        - This assessment show only knowledge of the stem of the ASOL.
    - *Test - Light*
        - This assessment tests for understand basic characteristics of visible light and how it behaves along with opaque, transparent, and translucent

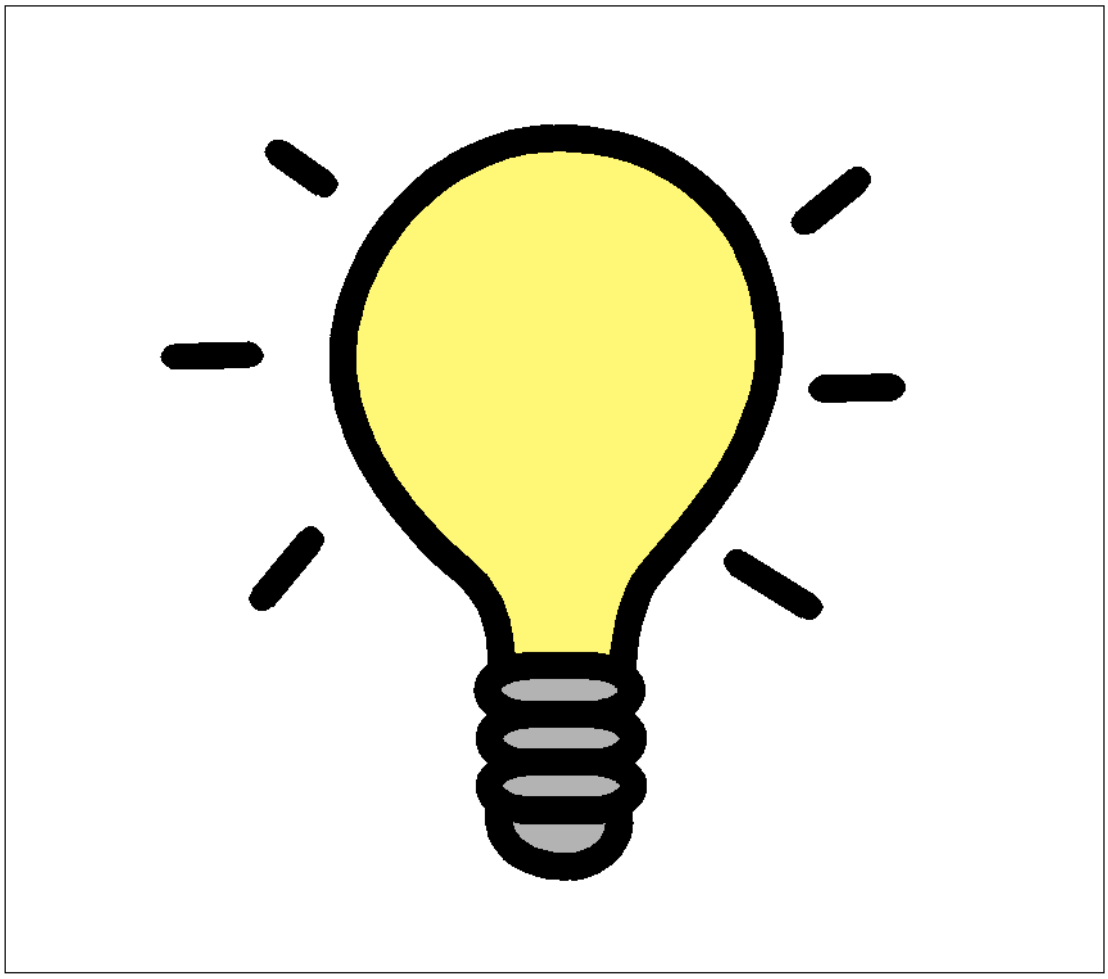
Specific Options for Differentiating this Activity:

- Provide the vocabulary words on cards and give the student two choices allowing for selection to be made using eye gaze or pointing.
- Provide limited choices of vocabulary on a voice output device such as a switch or Go Talk.
- Only complete the stem and focus on the vocabulary opaque, transparent, and translucent.

+ *MIND notes* are used in Augusta County Schools in the general education setting. When creating the MIND notes for this topic, the *Light MIND notes* were a guide to allowing the student to be able to take notes as the other students, but in a modified format.

SOL Study Book
Fifth Grade

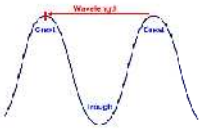
Light
(SOL 5.3)



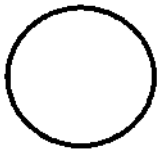
Adapted by Lorna M.B. Frizzelle from MIND Notes

Table of Contents

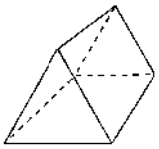
Page 1 : White Light

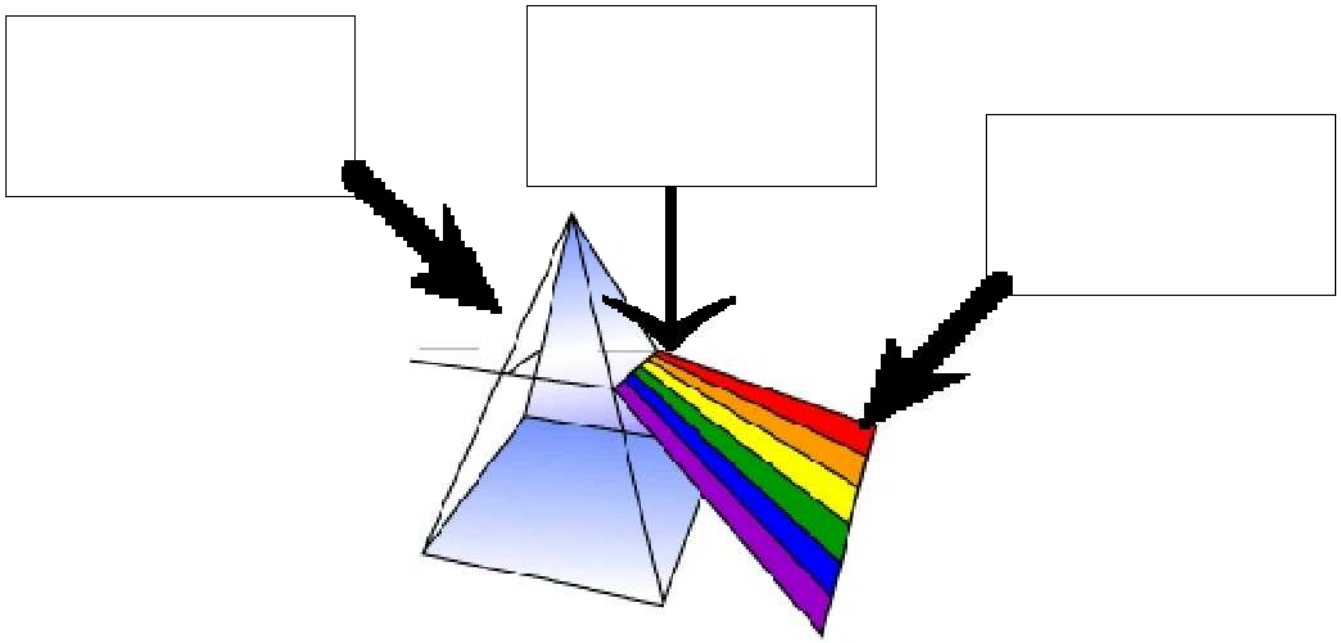
_____ is many different light wavelengths traveling

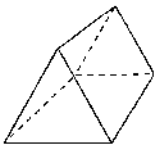


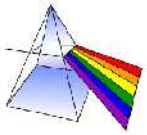

together. _____ discovered that white light goes

through a prism and makes a spectrum of colors.







The prism spreads colors out by _____ or refracting

the colors at different angles.

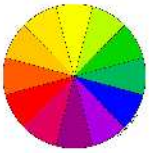
Page 1 : White Light



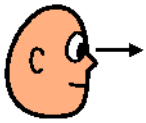
A _____ occurs from light going through water droplets.



The drops bend rays of sunlight at different angles. causing the

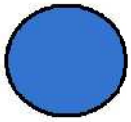



colors to spread out. The drop is like a _____.

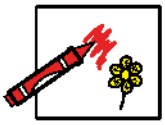
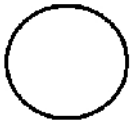



The colors we see in the spectrum are



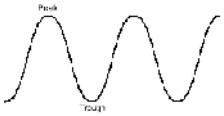

red, orange, yellow, green, blue, indigo, violet.

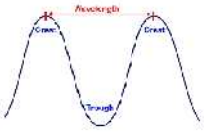
Color the circles to make the spectrum.

red	orange	yellow	green	blue	indigo	violet
R	O	Y	G	B	I	V

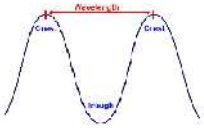
Page 1 : White Light



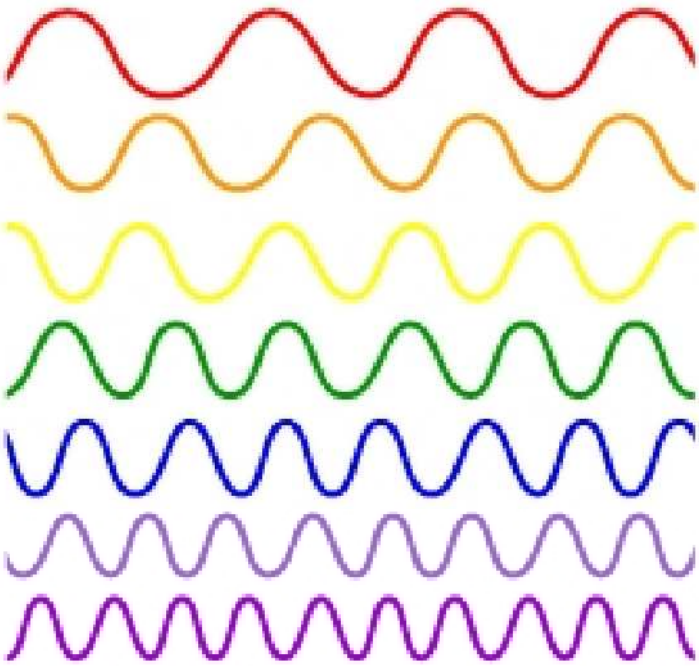
Light waves are characterized by their _____.

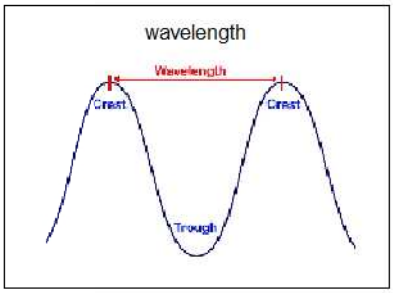


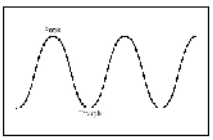
Red has the longest wavelength.



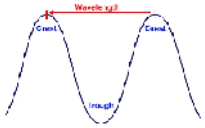
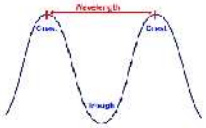
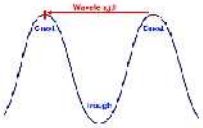
Violet has the shortest wavelength.

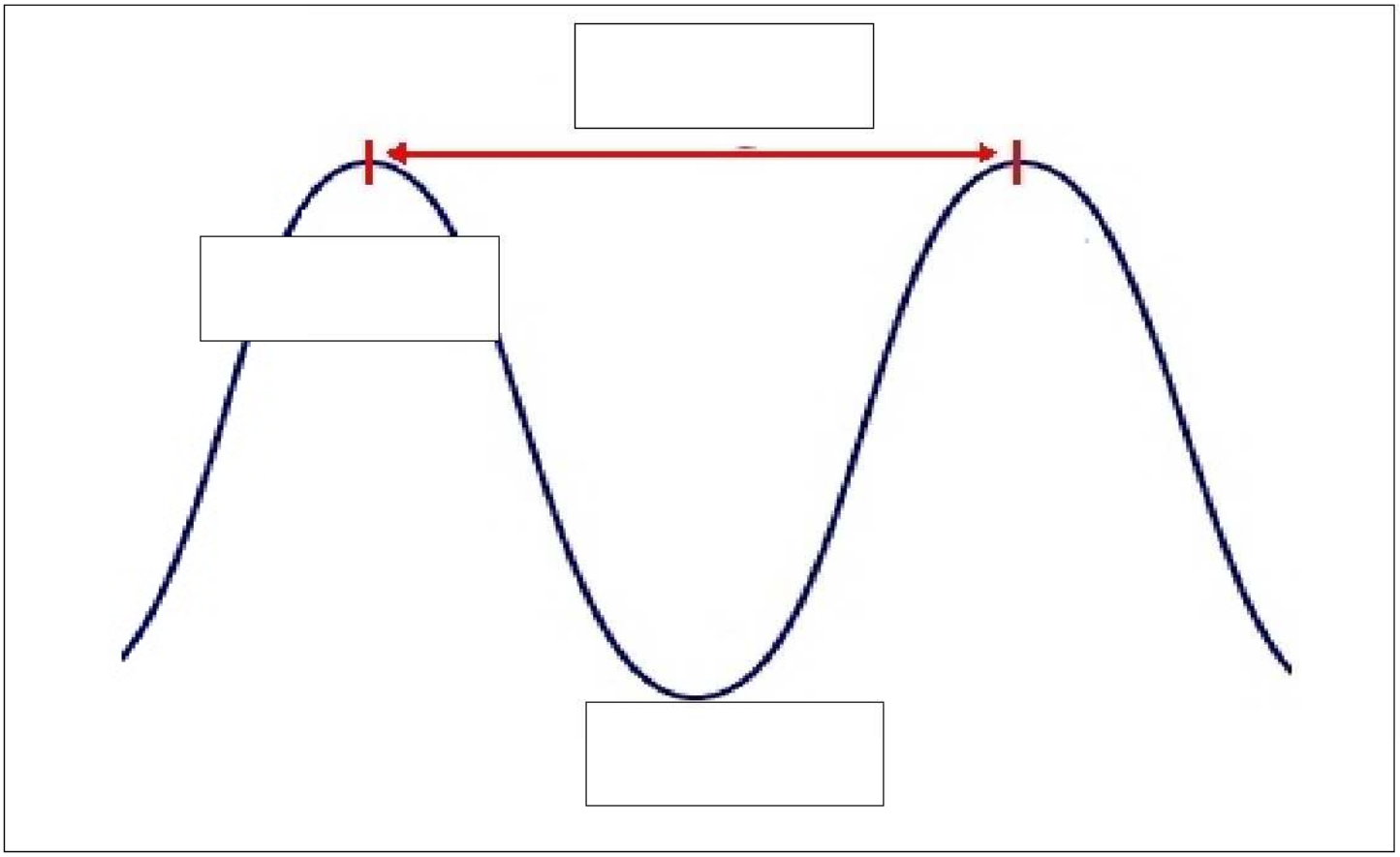


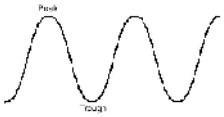




Page 2 : Light Waves

Light travels in  wavelengths that have a  crest and  trough.

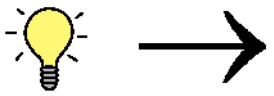




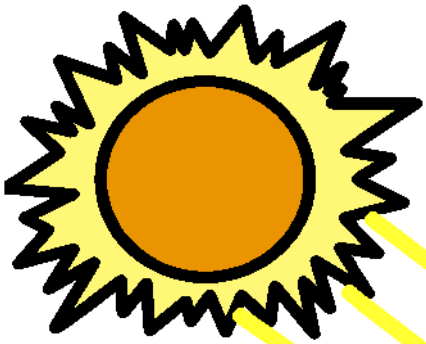
Light waves travel much faster than _____.

Light travels in straight paths called _____.

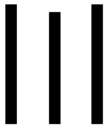
Page 2 : Light Waves



Light rays from the sun travel to Earth.



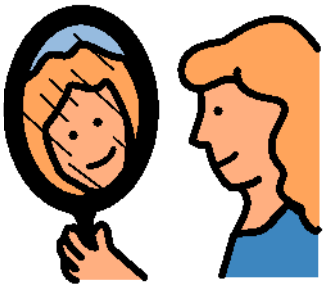
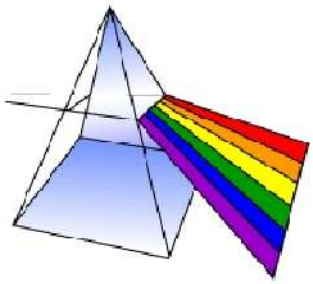
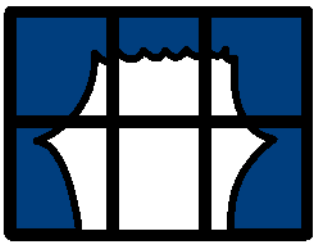
_____ minutes to travel!


Light travels in straight paths until it hits and object where it may be

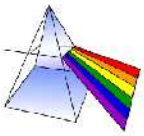


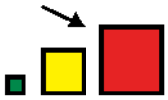
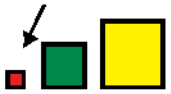

Page 2 : Light Waves

Vocabulary	Definition	Example
		look in mirror 
		prism 
		window 
		light bulb 

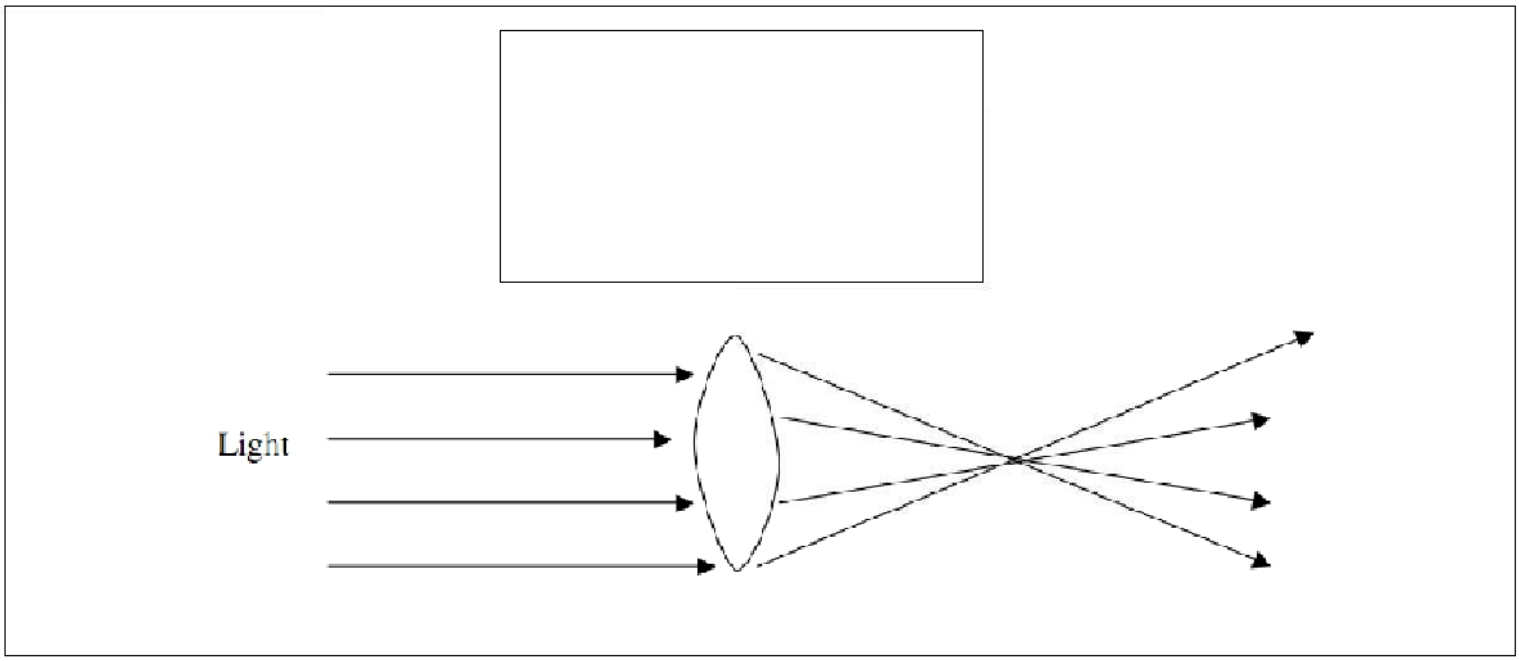
Page 3 - 4 : Light and Lenses

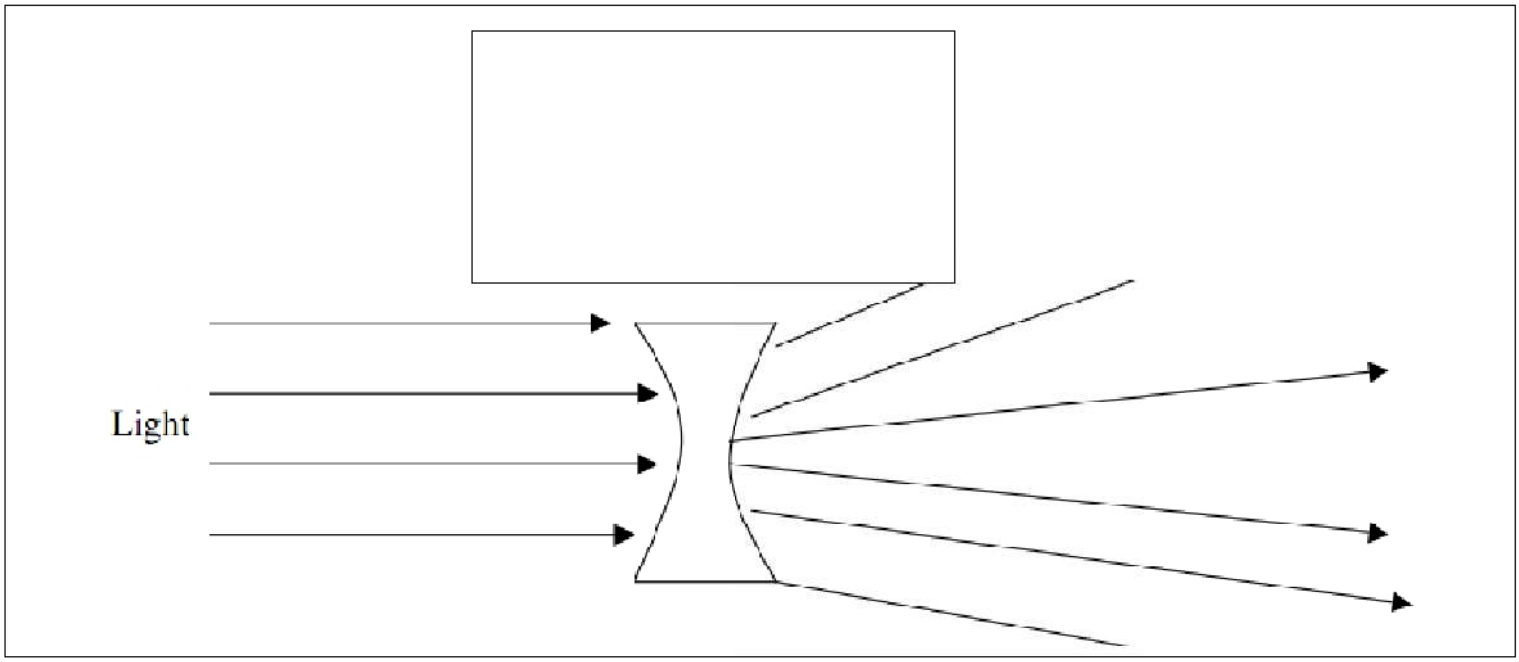
_____ are pieces of clear material with curved surfaces. They

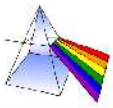


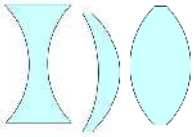
refract or bend light to make things look bigger or smaller.



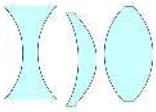




Page 3 - 4 : Light and Lenses



Common lenses that you might see are:




The lenses and mirrors in these things _____,

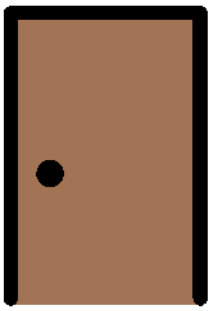
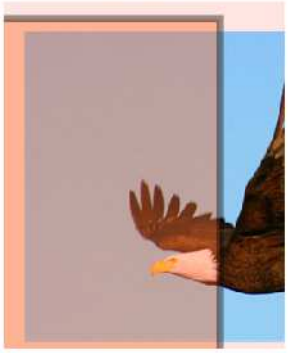
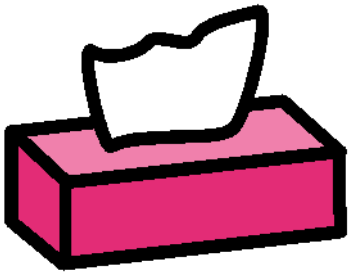
_____, and _____  light to make something

clearer.


Light is very important because it helps us

Page 3 - 4 : Light and Lenses

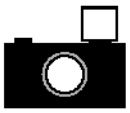
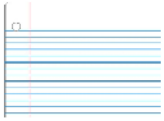

Light passes through some objects but is blocked by others.

Vocabulary	Definition	Example
opaque 		door 
transparent 		sunglasses 
translucent 		tissue paper 

Page 5 - 6 : Inventors and Scientists

Inventors ans scientists have used properties of  lenses and  mirrors to create  tools that have led to many discoveries.

X Mark the items that have  lenses or  mirrors.

camera	crayons	Notebook Paper	video camera	telescope
				

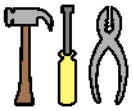
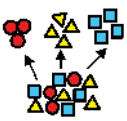
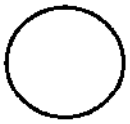
Sir Isaac Newton

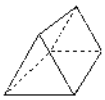
Sir

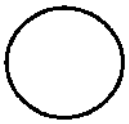
Isaac Newton

He discovered and named the _____.

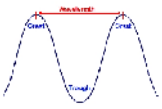
? Page 7 - 8 : Practice Questions

1. What is the  tool used to separate  white  light into a spectrum?

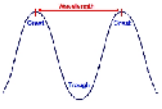
prism	telescope	microscope
		

2. When the  white  light passes  through the  prism, you can tell -

there is no color in light	white light is really colors	blue light is brigter than white
		

3.  what wavelength  is the longest?

red	yellow	violet
		

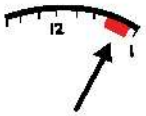
4.  What wavelength is the shortest?

red	yellow	violet
		

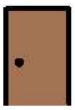
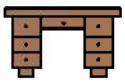
Page 7 - 8 : Practice Questions

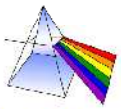

5. The rays from the sun take 8 1/2 _____ to get to

Earth.

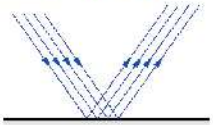
days	minutes	hours
		

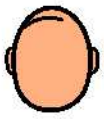
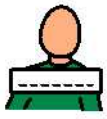
6. Which of the following materials is transparent?

sunglasses	door	desk
		



7. Refracting means to

transmit	reflect	bend
		


8. The person who discovered and named the visible spectrum is

George Mason	Christopher Columbus	Sir Isaac Newton
		

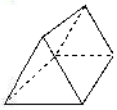
these go with page 1 notes

white light

rainbow

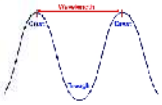
Sir Isaac Newton

prism

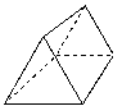


spectrum

wavelength



prism

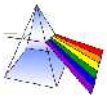


Colors

bending

middle

refracting

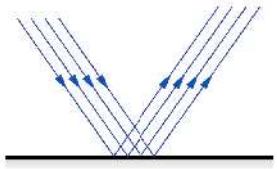


shortest

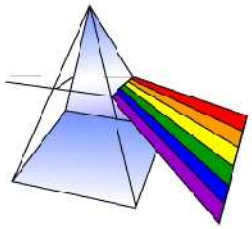
longest

these go with page 2 notes

reflected

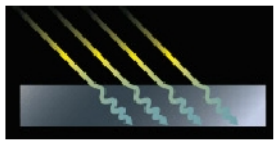


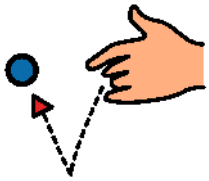
refracted



transmitted

absorbed

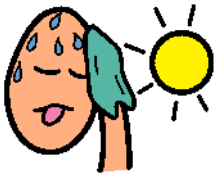




bounced off

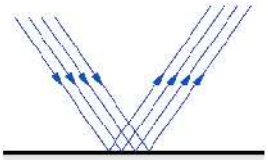
bent

passes through object

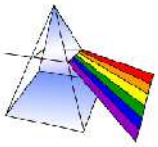


taken in as heat

reflected

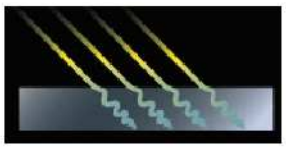


refracted

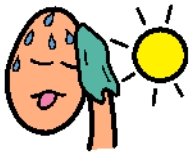


transmitted

absorbed



hot



cut

8½

10½

rays

sound

footballs

crest

wavelength

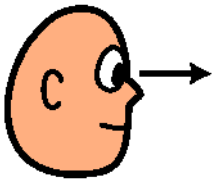
trough

these go with page 3 notes

rainbows

lenses

see



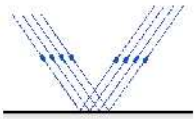
take pictures

see stars

see birds in trees

keep the sun out of our eyes

reflect

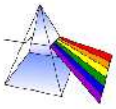


light passes through

clearly; may have color

transmit

refract



concave

convex

complete blocks light

from passing through

part of light

passes through

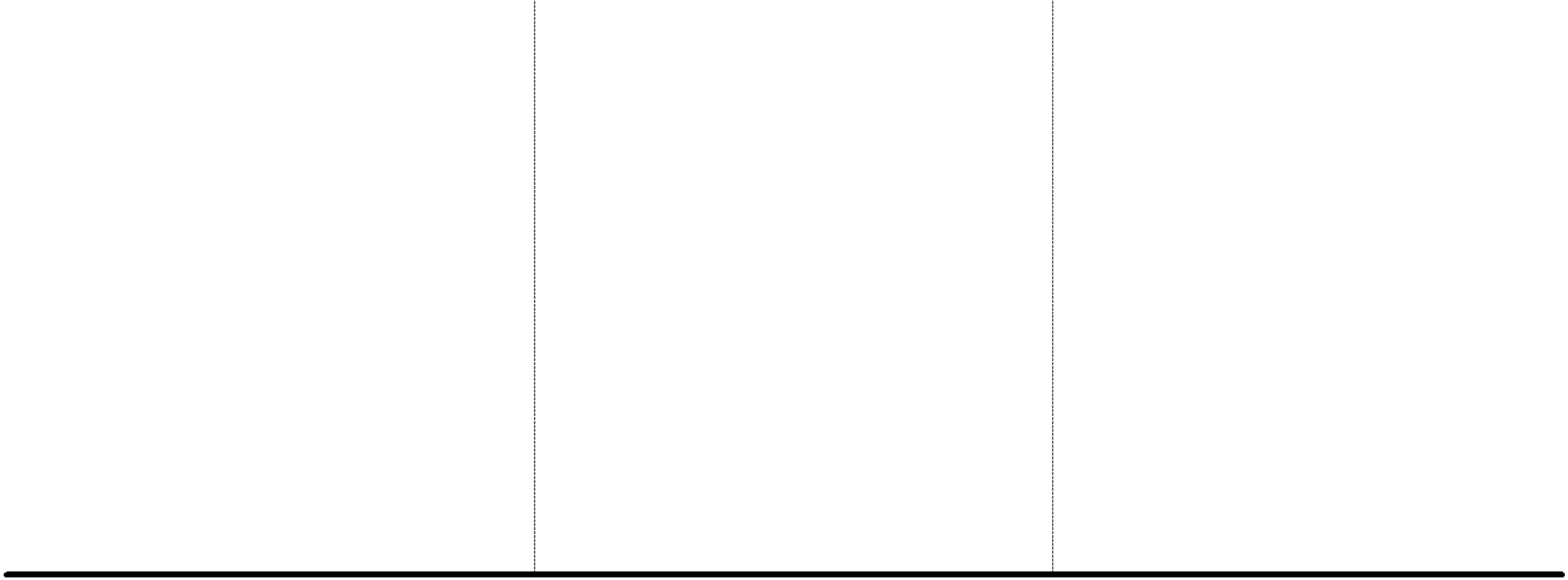
sunglasses

flashlight

binoculars

telescope

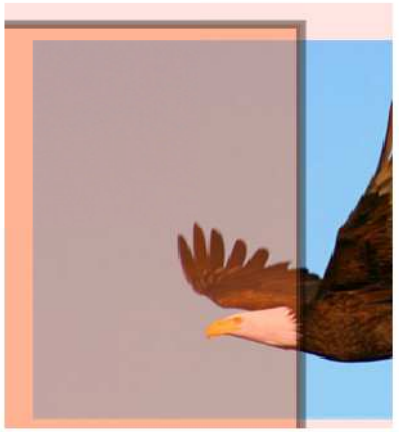
microscope



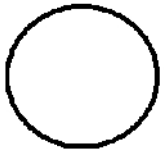
transparent

opaque

translucent



light passes



through clearly;

may have color

complete blocks light

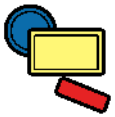
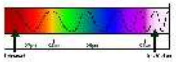
from passing through

part of light

passes through

Fold on the solid line. Cut on the dashed line. Paste according to directions.



Cut out the colors and labels to make your own spectrum on a new piece

of paper.

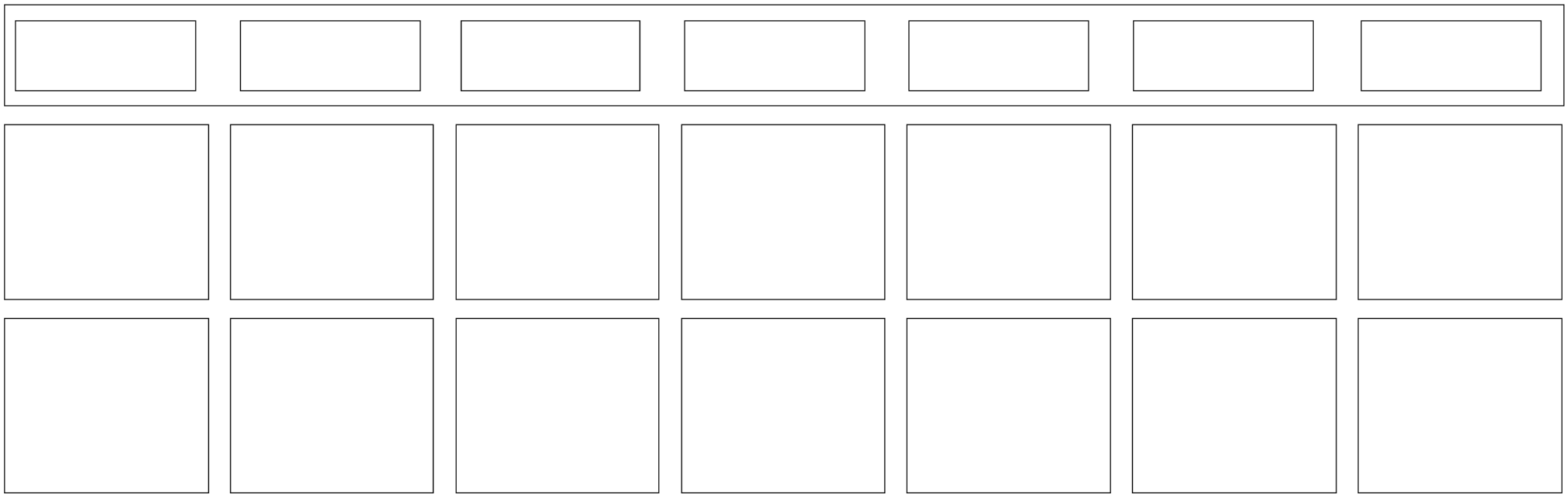
red	yellow	blue	orange
green	violet	indigo	

R	o	y	G
B	i	v	

- blue
- red
- yellow
- orange
- violet
- indigo
- green

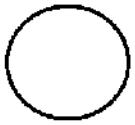
Make your own visible spectrum - created and designed by Lorna M.B. Frizzelle

spectrum

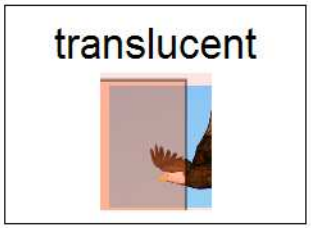


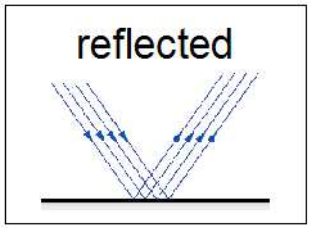
5.3 Vocabulary Quiz Name: _____

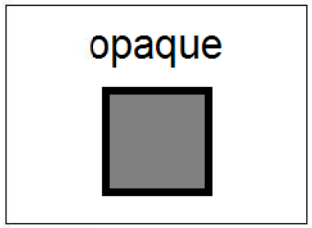




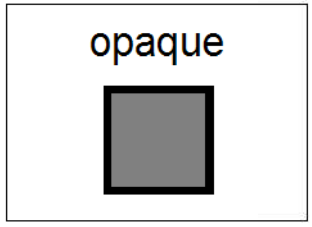

1. When light passes through clearly; may have color tent

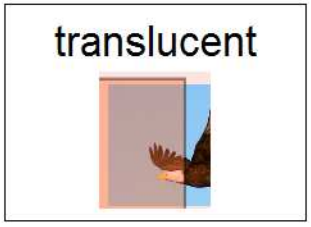


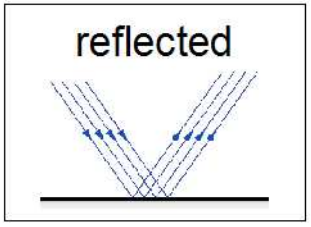




2. When light is completely blocked out

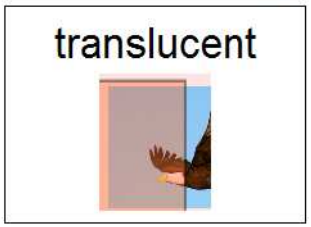


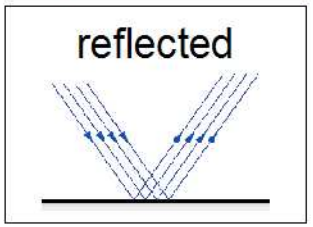


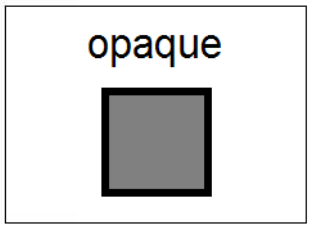




3. When part of the light passes through







5.3 Vocabulary Quiz Name: _____

Match the vocbulary with the correct definition.

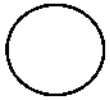
transparent

translucent

opaque

light passes through

clearly; may have color

completely blocks light

from passing through

part of light passes

through

5.3 Vocabulary Quiz Name: _____

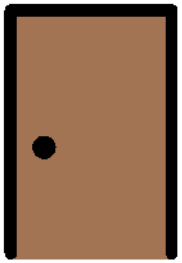
Match the example of what the light wave is doing with the vocabulary word.

translucent

opaque

transparent

door



sunglasses

tissue paper