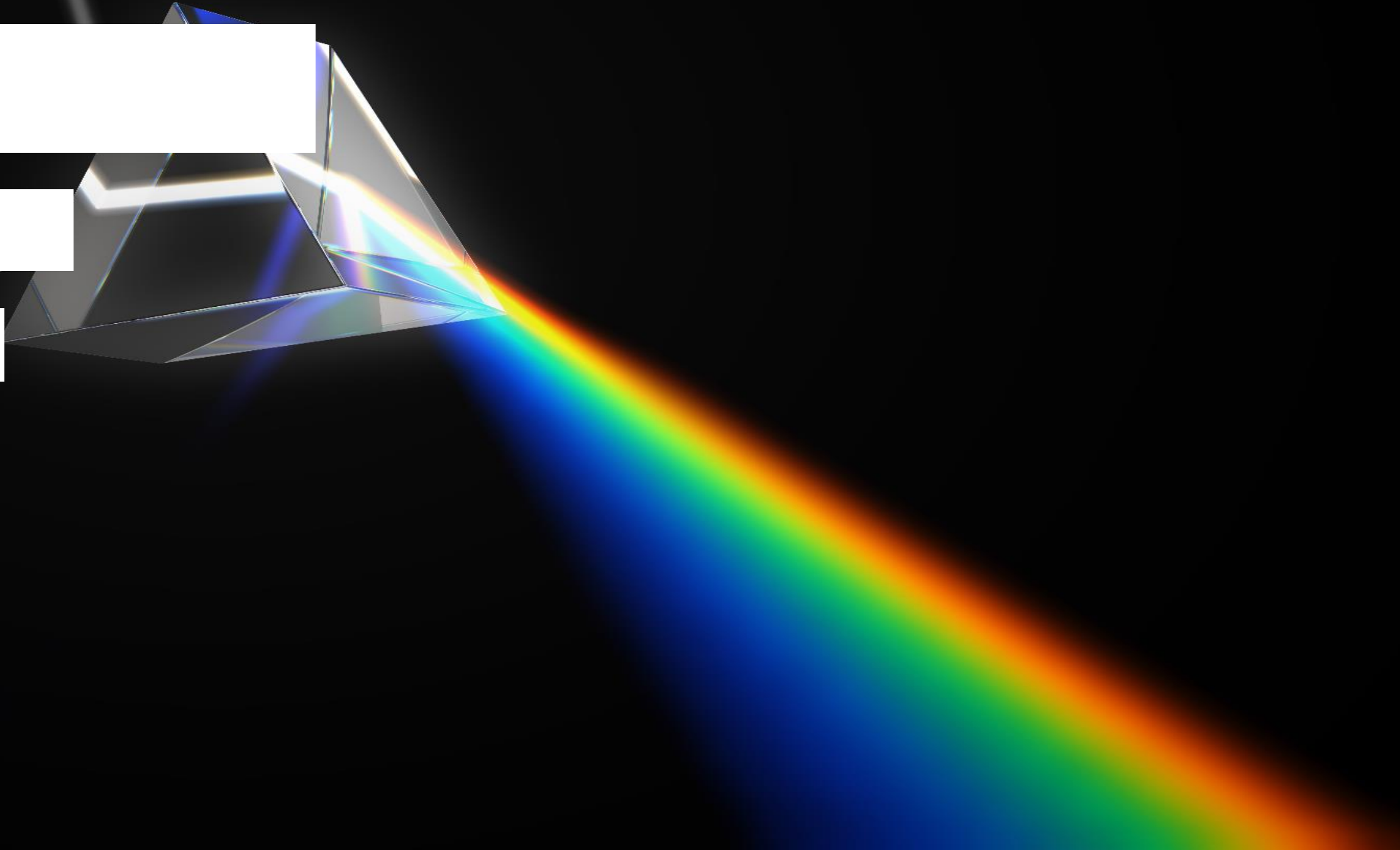


Light

YEAR 3

Summer 1



LESSON 3

What is refraction and how can we use it?



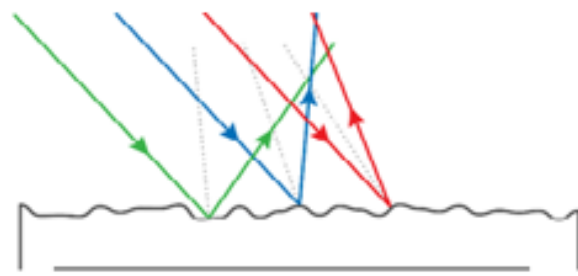
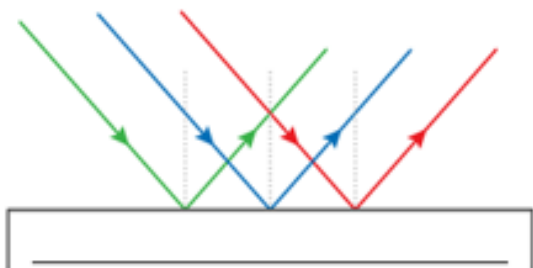
Do Now – Retrieval

1. What do we mean by darkness?

2. Fill in the following sentence

Reflection is when light _____.

3. Label the diagrams below with 'specular reflection' or 'diffuse reflection'



From previous units

Draw the particles in a solid, liquid and gas:

Solid	Liquid	Gas





What appears to happen to a pencil when you put it in water?



Read the following passage about refraction

As we have learned, a transparent material is a material that light can pass through. Examples of transparent materials include clear plastic, glass, water and air.



Give 2 examples of materials that are transparent materials

Sometimes, when light hits a transparent object from a certain direction, reflection can take place (such as when light hits a puddle) as the light bounces off the surfaces of the second material. However, a lot of the time, when light moves from one transparent material to another, the light can **change direction**. When light moves from one transparent material to another and changes direction, this is called **refraction**.



What happens to the light when refraction takes place?

When a pencil is placed in a glass of water, light enters the water and bounces off the pencil. As light moves out of the water however, it changes direction slightly. This makes it look as if the part of the pencil inside of the water has moved and the pencil has become bent. In fact, it is only that the light that has reflected off the pencil has changed direction as **refraction** of the light takes place.



Why does the part of the pencil in the water look bent?

The effect of refraction is used in diamonds and other jewellery to create a sparkling effect, to create coloured light from white light and to focus light on a point or spread it out as in a magnifying glass.



Give one use of refraction

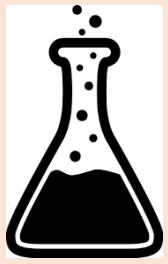


Watch the demonstration of refraction by your teacher. Write down two observations that you noticed from the demonstration.

(A ray of light bouncing off a block and going through but at a different angle

A pencil being placed in water and seeing it moving at a different direction

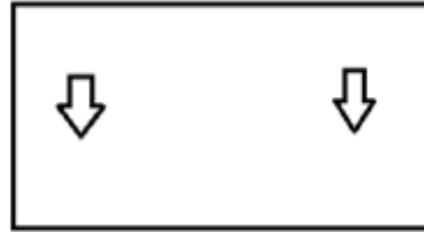
Water in a perspex measuring jug/round glass – two lines of colour that appear to switch)



Complete the practical below to show the effect of refraction (demonstrated here if required

<https://www.youtube.com/watch?v=9n362snGUdw>)

- 1) On a piece of A4 paper, draw an arrow at each end facing in the same direction as shown in this diagram:



- 2) Take a circular glass (such as a beaker) and fill in up so that it is $\frac{3}{4}$ full of water



- 3) Turn the paper so that one of the short sides is on the table and paper is vertically upright
- 4) Place the paper so that you can see one of the arrows through the water and the other arrow is above the water

What did you observe?

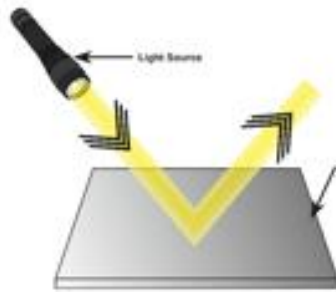
I observed that _____.

Why do you think this has happened?

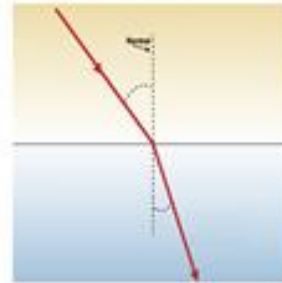
I think this happened because _____.



Write down if light is reflected or refracted in each of the examples below and say why:



This is r _____ because _____



This is r _____ because _____



This is r _____ because _____



This is r _____ because _____



This is r _____ because _____



This is r _____ because _____



Why is it difficult to know exactly where a fish is in a fish tank?



Return to page 3 to complete the learning review