**Sc8.2 : Optics Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Chapter 4 Review**

**Nature of Science – History of Light**

1. Describe what these scientists did regarding theories and experiments on light.
   1. Pythagoras –

* 1. Galileo -
  2. Michelson -

1. Define light.
2. What is the speed of light?

How does it compare with the speed of sound?

1. Give examples of technologies based on light. (There are 10 in your notes.)

**Properties of visible light**

1. Identify and describe the following properties of light
   1. rectilinear propagation
   2. a vacuum
   3. What is the difference between these terms and give an example of each:   
        
      transparent -   
        
      translucent -   
        
      opaque-
   4. What are:   
        
      specular reflection -   
        
        
      diffuse reflection -
   5. What is refraction? -
   6. What is dispersion? -

**The electromagnetic spectrum**

1. List the colours of white light, in order of degree of refraction from red (least refracted) to violet (most refracted)
2. Draw and label a transverse wave. Be sure to label wavelength, wave height, amplitude, crest and trough.

What is frequency?  
  
  
  
  
What is the relationship between frequency and wavelength, and why is it called an inverse relationship?

1. Which colour of visible light:  
     
   Has the longest wavelength? -  
     
   Has the shortest wavelength? -  
     
   Refracts the most? -  
     
   Refracts the least? -
2. Write the names of the different types of waves of the in order of longest wavelength to shortest wavelength. Draw a representation of the wave under it.

Which has the longest wavelength?  
  
Which has the shortest wavelength?  
  
Which has the lowest frequency?  
  
Which has the highest frequency?

Which has the highest energy?  
  
Which has the lowest energy?

1. Provide examples of uses and possible dangers of each type of electromagnetic radiation:

|  |  |  |
| --- | --- | --- |
| Type of radiation | Uses | Possible dangers |
| Radio waves |  |  |
| Microwaves |  |  |
| Infra-red |  |  |
| Visible light |  |  |
| Ultraviolet |  |  |
| X-Rays |  |  |
| Gamma rays |  |  |