**Ascot High School**

**Science Department**

**UNIT PLAN September - December, 2025 Grade 11 - Physics**

| Duration | Topic | Sub-topic | Specific Objectives | Assignments/Projects & Due Dates |
|---|---|---|---|---|
| **September 1-12 Orientation Activities & Diagnostic Test** | | | | |
| Sept. 15-Oct.17 | Waves and Optics | Wave Motion<br>**1. Types of Waves** | • Differentiate between types of waves.<br>-Pulses, progressive waves, transverse and longitudinal waves. | **Activity**<br>Production of waves using springs and in ripple tanks.<br>Draw diagrams of:<br>a. Transverse waves in ripple tank and slinky spring.<br>b. Longitudinal wave in a slinky spring. **Virtual Simulations** |
| | | **2. Wave Parameters** | • Apply speed, frequency, wavelength, period and amplitude.<br>• Represent transverse and longitudinal waves in displacement-position and displacement- time graphs.<br>-Note: A progressive wave varies in both time and space simultaneously. To represent it on paper, either time or position must be held constant. | |

| | | | | |
|---|---|---|---|---|
| | | | | |
| | Waves and Optics | Electromagnetic waves | • State the properties of electromagnetic (e.m.) waves.<br>-For example travels same speed, are transverse and propagates in a vacuum.<br>• Differentiate between types of e.m. waves in terms of their wavelengths.<br>-Radio, infrared, visible, ultraviolet, x-rays, Y-rays. Discuss the spectrum.<br>• Identify a source and use of each type of e.m. wave. | **Research Project & Class Presentations (10%)**<br>**Worksheet: Wave Motion (10%)**<br>**Due Date October 22, 2025** |
| ***NATIONAL HEROES DAY & MID-TERM BREAK***<br>***SESSIONAL TEST ONE (20%)*** | | | | |
| Nov. 3-Dec.5 | Waves and Optics | Light Waves<br>**-Wave Particle Duality** | • Compare the rival theories of light held by scientists.<br>-Theories of Huygens, Newton, Young, Einstein. Recall that in the 20th Century experiments have provided evidence that light has both a particle and a wave nature. **Knowledge of the photoelectric effect not required.** Photo sensors, digital cameras.<br>• Conduct a Young's double slit experiment to show that light is a wave. | **Practical Activity**<br>Young's experiment looking at a straight filament lab through a double slit. |

| | | | | |
|---|---|---|---|---|
| | | **Rays of Light** | • Explain why the diffraction of light is not normally observed.<br>-Wavelength comparable to the width of slit.<br>• Apply the principle that light travels in straight lines.<br>-Use straight lines to represent beams. Shadows, eclipse, pin hole camera. | .<br><br>**Practical Activity**<br>Demonstrate that light travels in straight lines. Construct a pin hole camera. |
| | | **Reflection** | • Apply the laws of reflection.<br>• Describe the formation of images in a plane mirror.<br>-Object and image distances are equal. The image is virtual and the object size is equal to the image size. | **Practical Activities**<br>Perform experiments to show the angle of incidence and the angle of reflection are equal.<br>Locate virtual image using:<br>a. ray plotting<br>b. no parallax method.<br>Construct diagrams to show the formation of virtual images. |
| | | **Refraction** | • Give examples of observations which indicate that light can be refracted.<br>-Appearance of water on the road, apparent depth of swimming pool. Refraction occurs as a result of the change of speed and light.<br>• Describe the refraction of light rays.<br>-Recall that the passage of a ray of light through a rectangular block may result in lateral displacement of that ray. | **Practical Activities**<br>Activities to illustrate refraction of light, for example, pencil in water.<br>Passage of light rays through<br>a. rectangular blocks<br>b. triangular prism |

| | | | | |
|---|---|---|---|---|
| | | | • Describe how a prism may be used to produce a spectrum.<br>-Use a source of white light. Newton's experiment with prisms.<br>• Apply Snell's Law<br>-Definition of refractive index.<br>**Review Videos on Reflection and Refraction**<br>**https://www.youtube.com/playlist?list=PLommgjqxfvuxkoPEx_dNbdPso4h0Wyz7N**<br>https://www.youtube.com/watch?v=RJ8HFbd1L6Q | Draw diagrams<br>Demonstrate dispersion using a triangular prism.<br>Perform an experiment to test Snell's Law.<br>**Worksheet on Reflection and Refraction (10%)-Nov. 28, 2025** |