Thin Film Interference – Intro – 11.6

Give an everyday example of thin film interference

_____

♦ Start with a sketch of Fig. 11.31

♦ The light first (see '1') partially _____ and partially _____ at the first interface. (remember: interface is the boundary between 2 media)

♦ We are concerned with the 'phase shift' of the 2 waves.
Define phase shift: _____

Effect #1 - Path Difference Effect

♦ A phase shift of 1,2,3, etc. λ means you have _____ interference or a _____band.

♦ A phase shift of 0.5, 1.5, 2.5 etc. λ means you have _____ interference or a _____ band.

♦ Note: The frequency of light does not change in a new medium (red light stays red light for example) but the wavelength does!!
Formula for finding new wavelength $\lambda_{new} = \lambda_{air}/n_{new}$

♦ Use the new wavelength and the thickness of the film x2 (light goes down and up!) to determine how many wavelengths path difference there is.

♦ Follow the example worked in text – it helps!! (especially if you miss the lesson).

Effect #2 – Refractive Index Effect

♦ Write the rule for how a light wave reflects based on refractive indices.

➔ ***Whether a bright or dark band appears depends on the combination of these two effects!*** ←