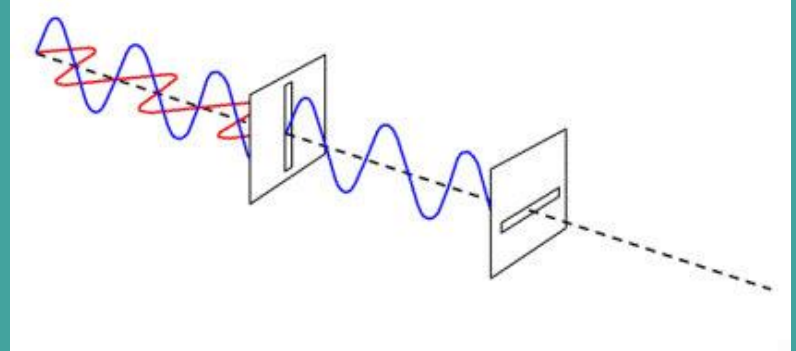


Polarisation

In this lesson:

- Be able to explain polarisation, and why it provides evidence of transverse waves
- Know some applications for polarisation



Hills Road
Sixth Form College
Cambridge

3.3.1.2 Longitudinal and transverse waves

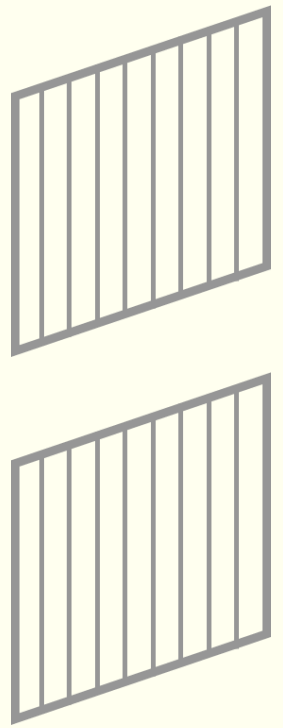
Content	Opportunities for skills development
<p>Nature of longitudinal and transverse waves.</p> <p>Examples to include: sound, electromagnetic waves, and waves on a string.</p> <p>Students will be expected to know the direction of displacement of particles/fields relative to the direction of energy propagation and that all electromagnetic waves travel at the same speed in a vacuum.</p> <p>Polarisation as evidence for the nature of transverse waves.</p> <p>Applications of polarisers to include Polaroid material and the alignment of aerials for transmission and reception.</p> <p>Malus's law will not be expected.</p>	<p>PS 2.2, 2.4 / MS 1.2, 3.2, 3.4, 3.5 / AT i</p> <p>Students can investigate the factors that determine the speed of a water wave.</p>

What is going on here?

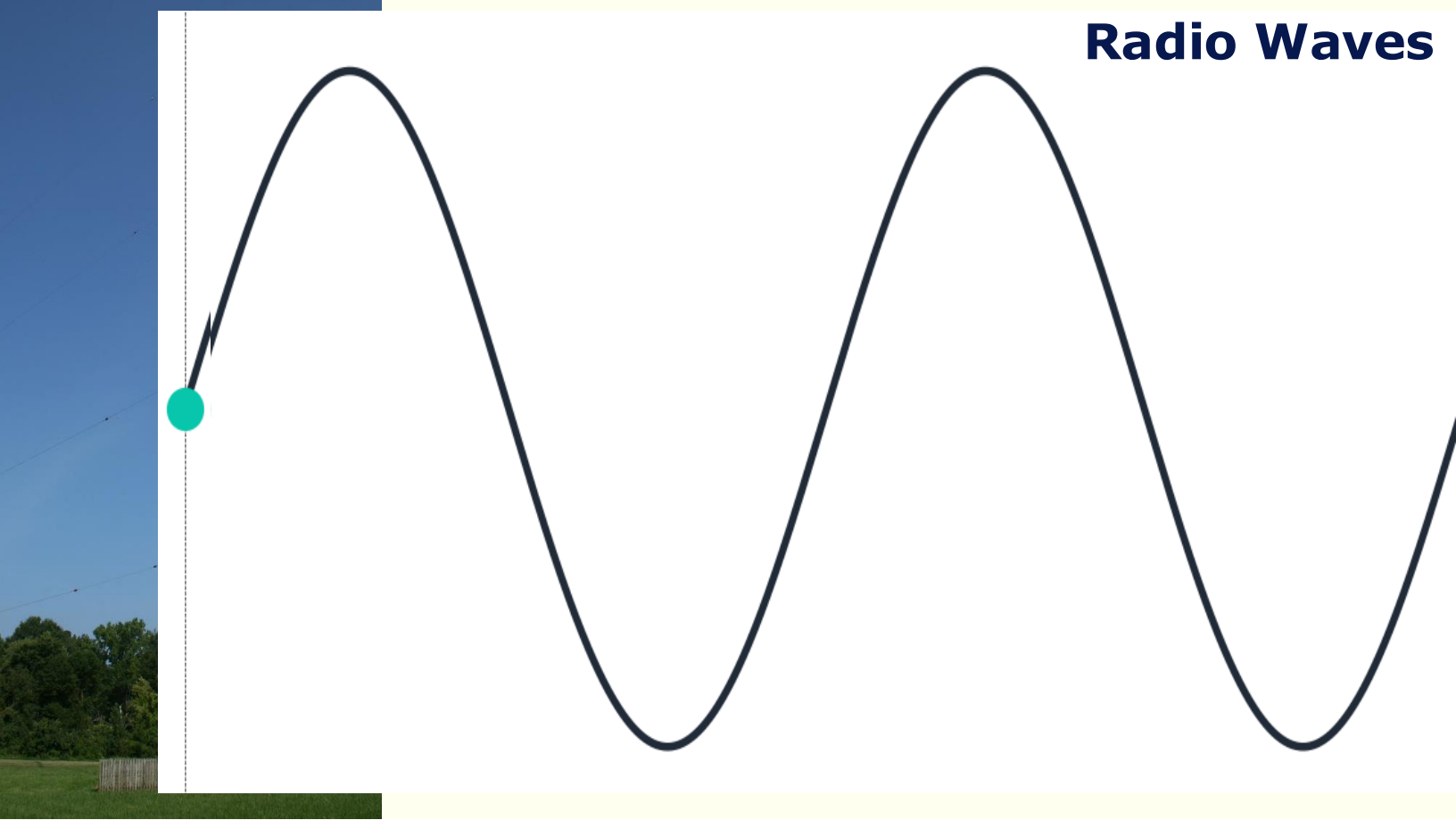
<https://www.youtube.com/watch?v=buWgyrv56X8>

Polarisation - Demo

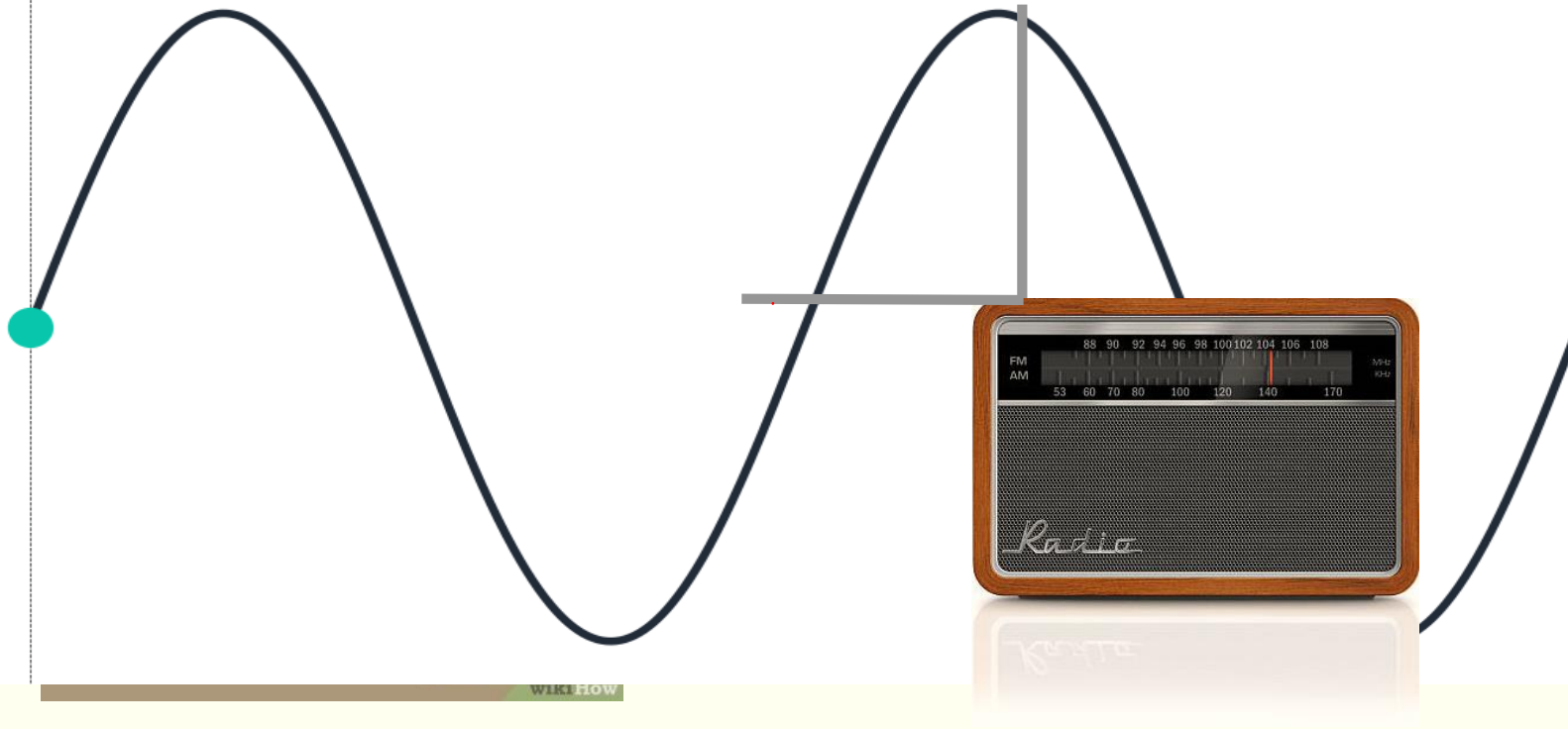
1. What is unpolarised light?
2. What type of waves can be polarised?
3. I have two polaroid filters. Explain how you can use them (in some combination) to completely block unpolarised light



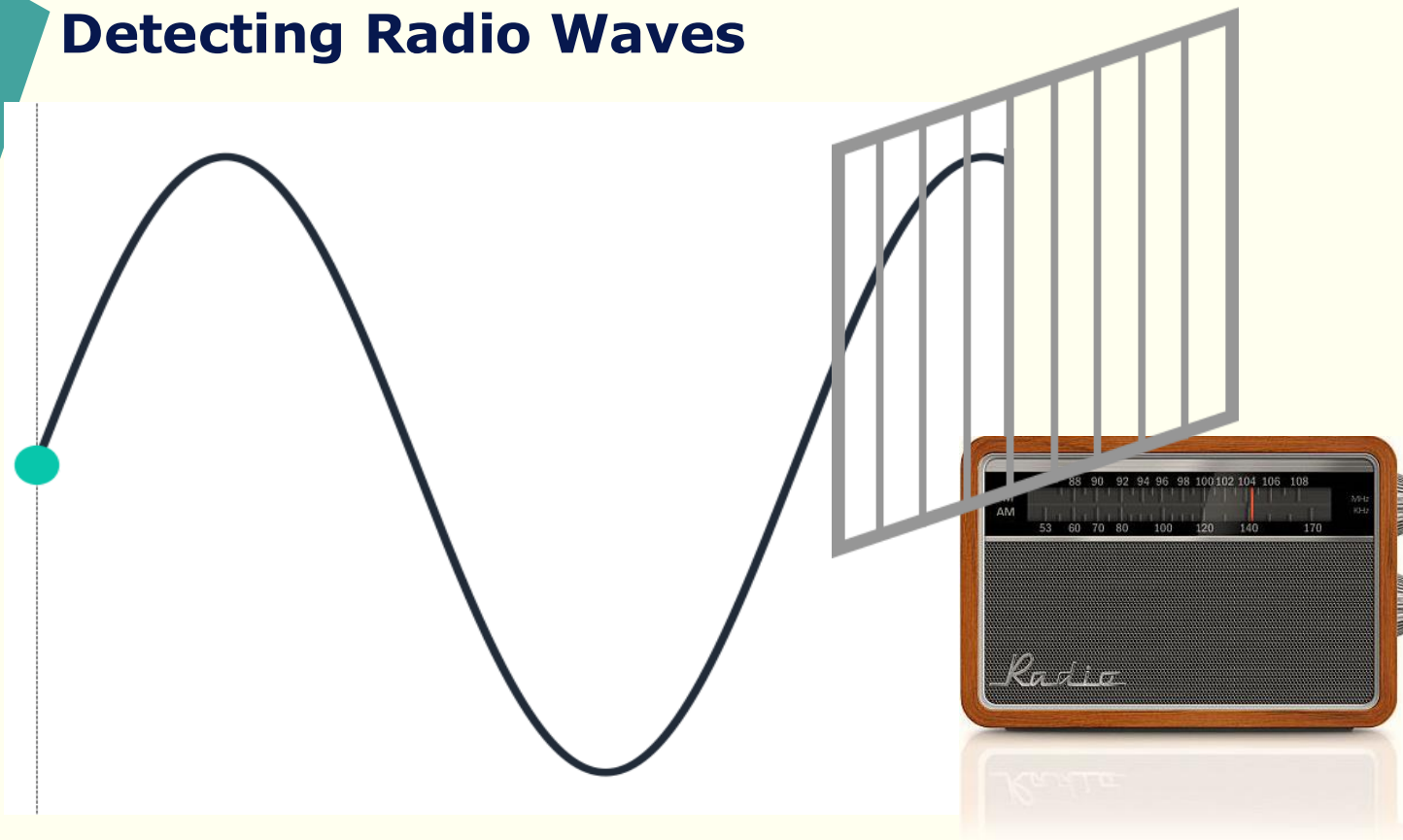
Radio Waves

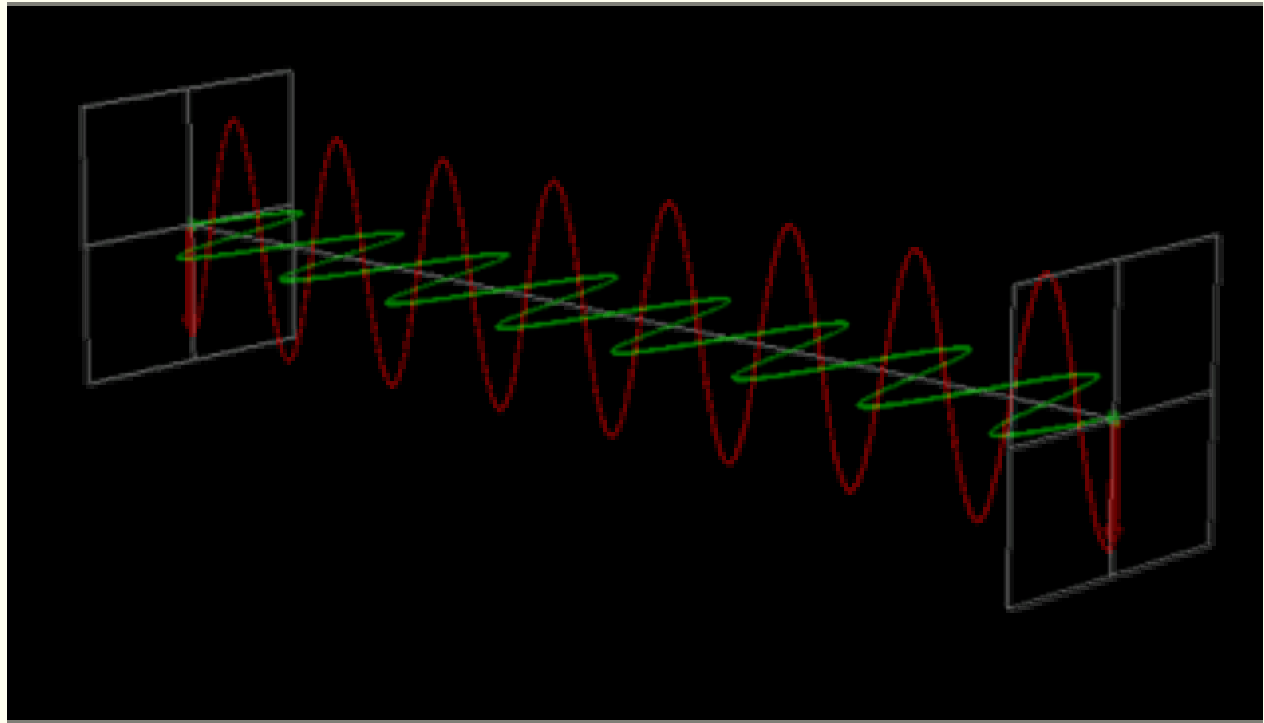


What direction does the antenna need to be in to detect the radio waves?

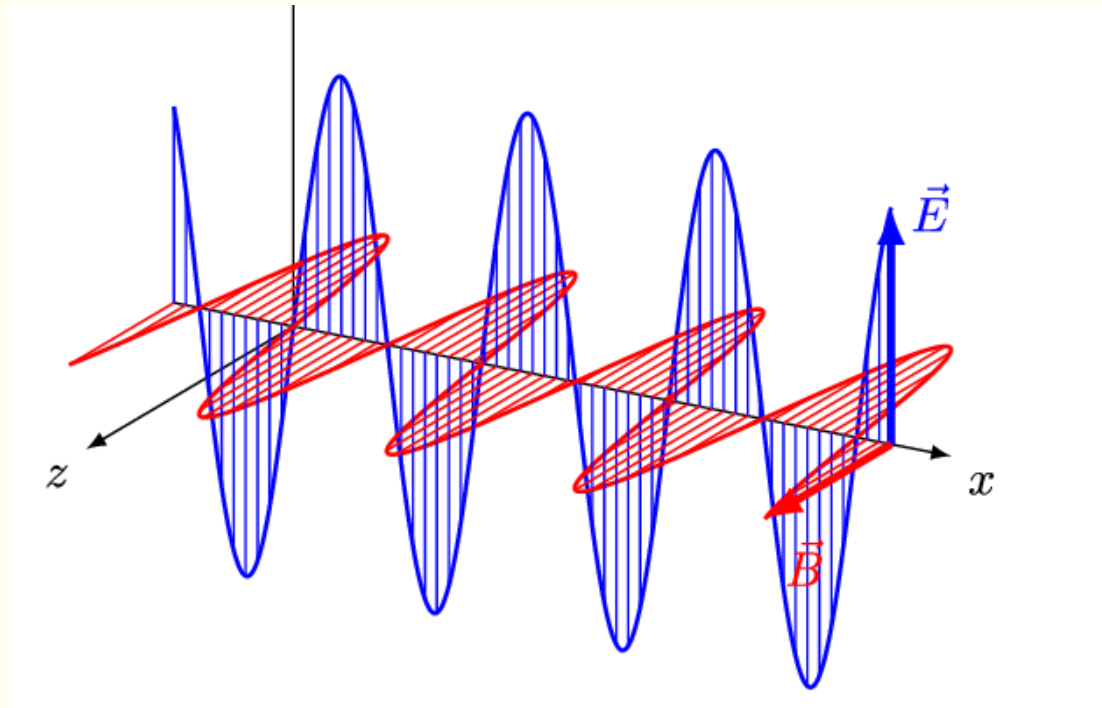


Detecting Radio Waves

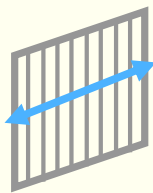




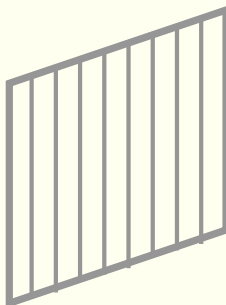
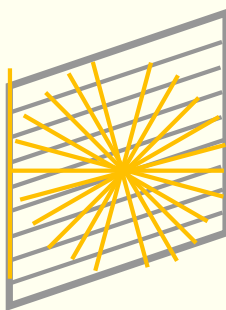
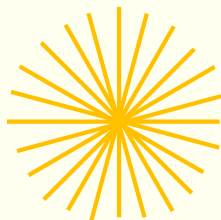
Electromagnetic Waves



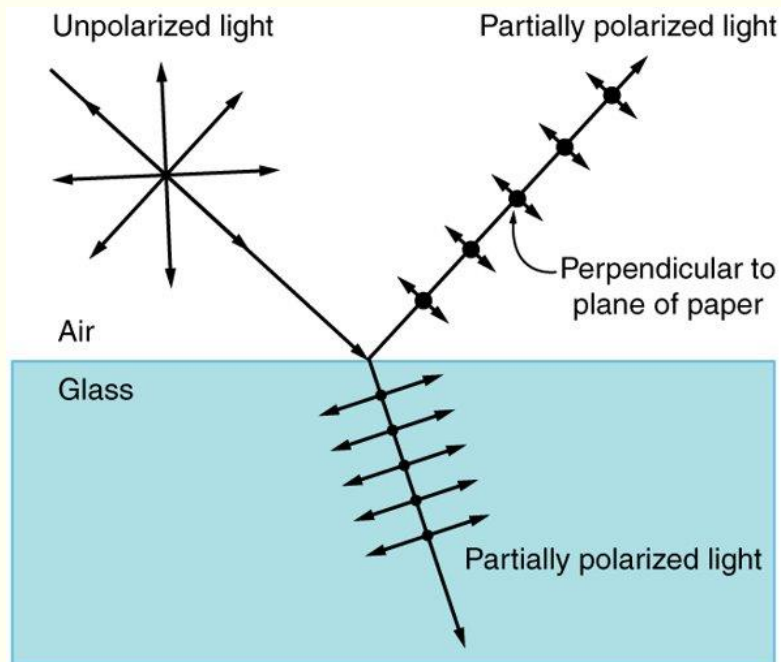
Polarisation



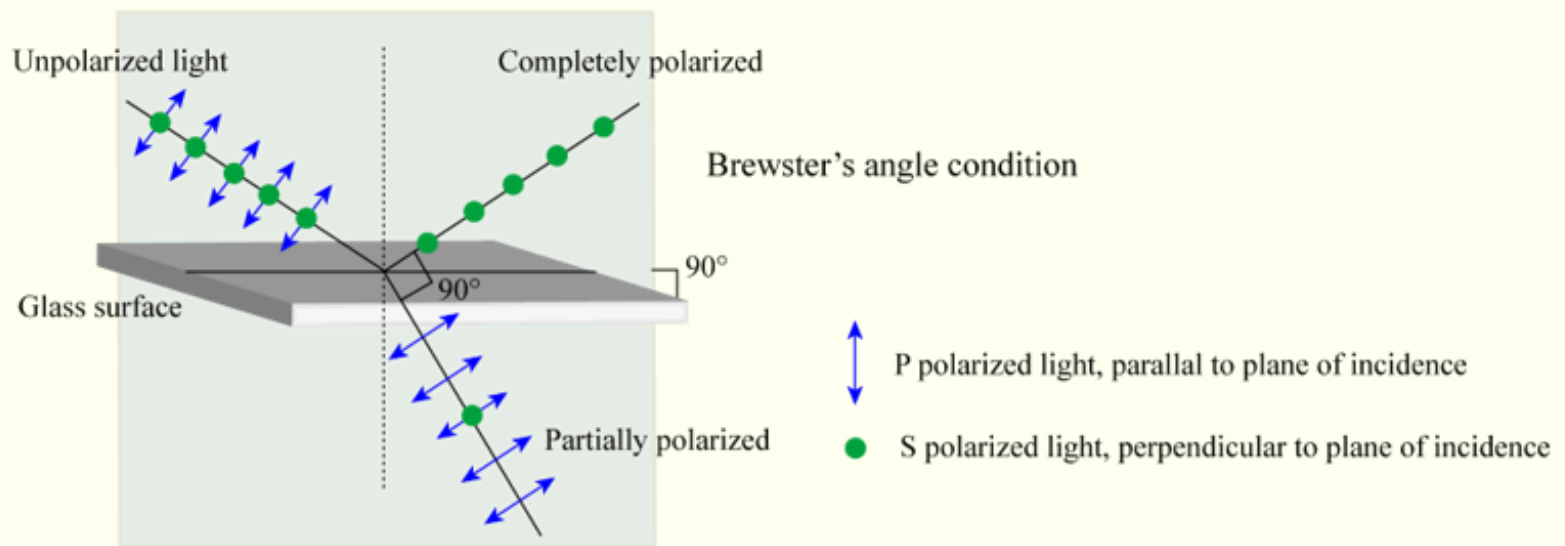
The blue arrow represents the axis of transmission of the filter



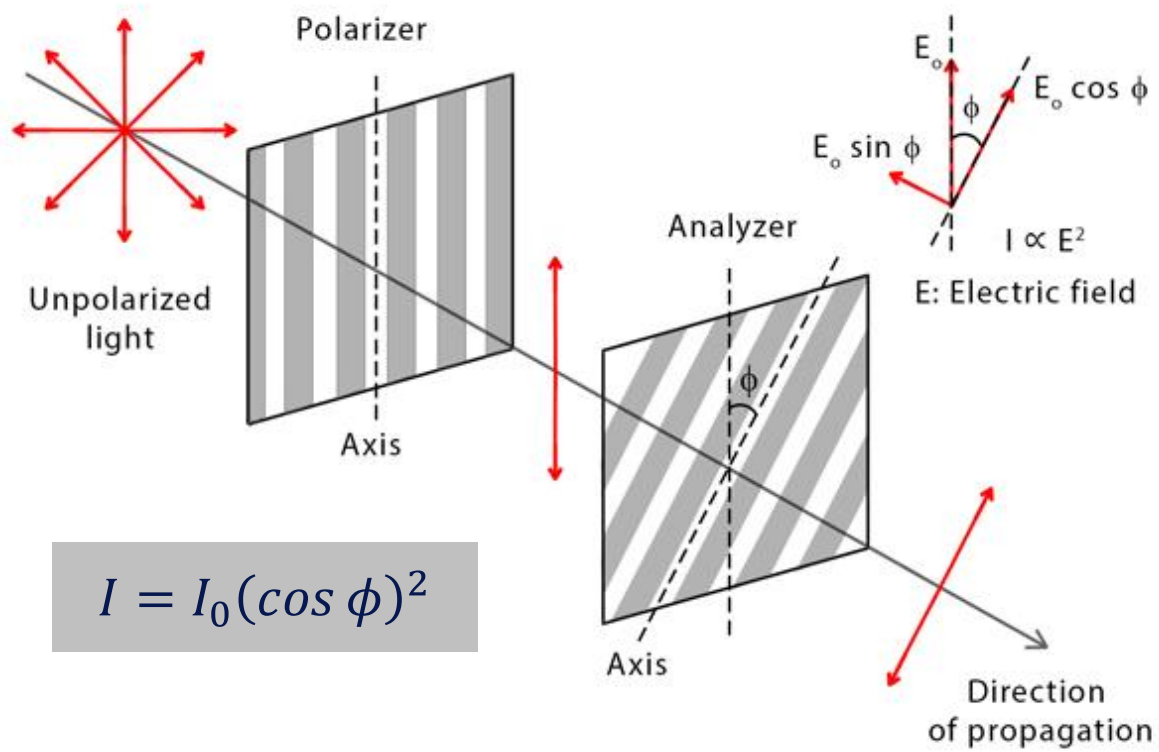
Polarisation of Reflected Waves



Polarisation of Reflected Waves



Extension: Malus' law



Polarisation

After watching this animation you should be able to:

- recall that electromagnetic waves are transverse waves with an oscillating electric field at right angles to an oscillating magnetic field
- explain that transverse waves can be polarised, and that this means the oscillations are all in the same plane
- explain that two polarising filters with perpendicular planes of transmission will completely block a transverse wave.

<https://tinyurl.com/yarlkwmmn>

Acknowledgements
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1 of 3

Next >

Polarisation is a property of one type of wave.

- (a) There are two general classes of wave, longitudinal and transverse.
Which class of wave can be polarised?
- (b) Give *one* example of the type of wave that can be polarised.
- (c) Explain why some waves can be polarised but others cannot.

Q2a ZigZag Summary Questions



I thought I would never know the difference between sine and cosine...

Turned out it was just a phase.