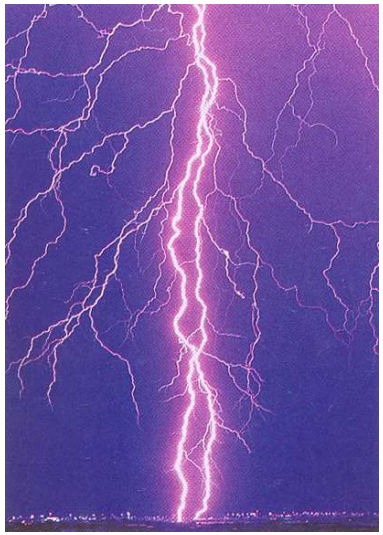
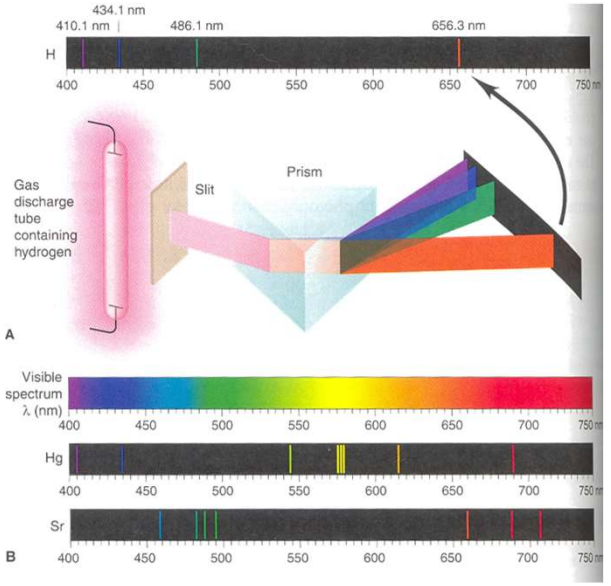
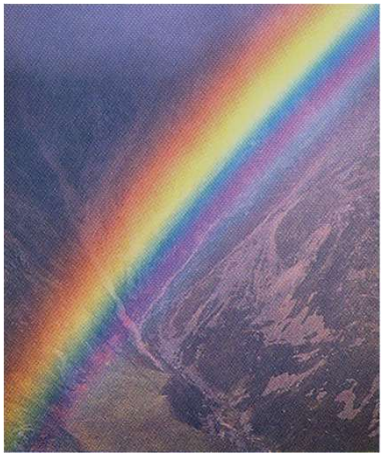
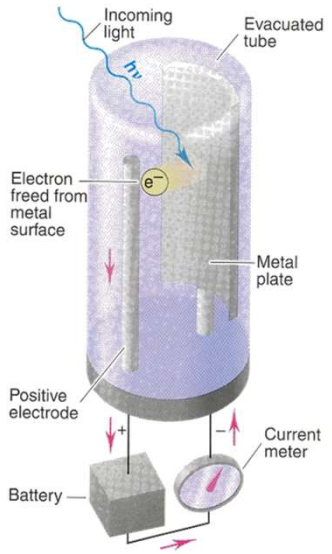




Chapter 7

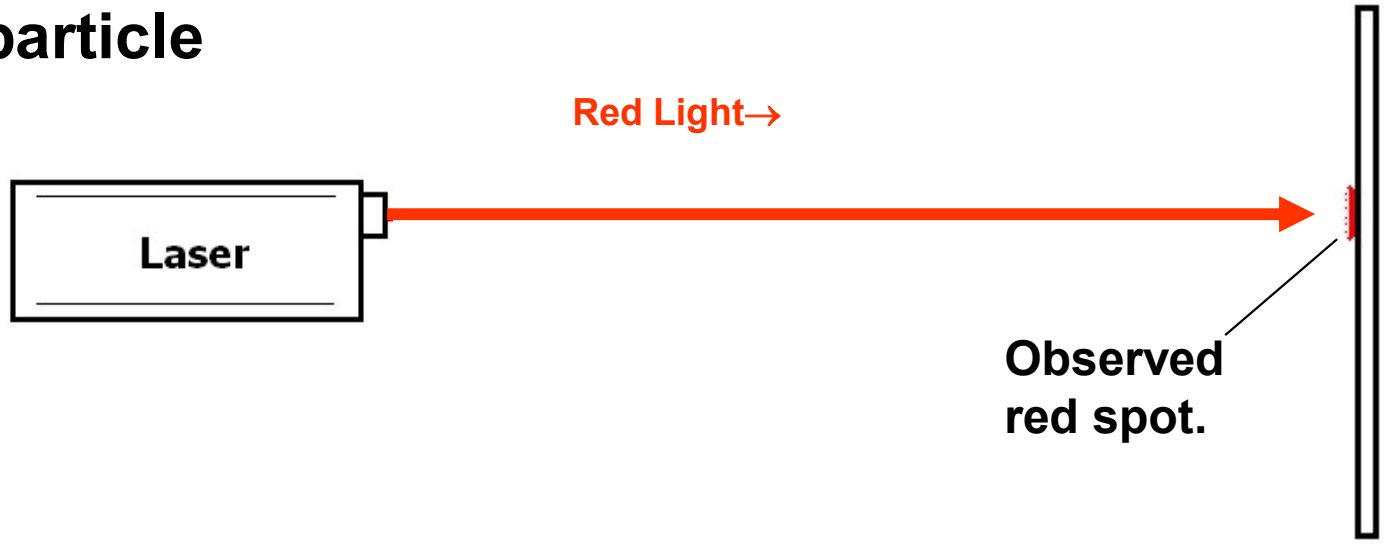
Light and Spectroscopy



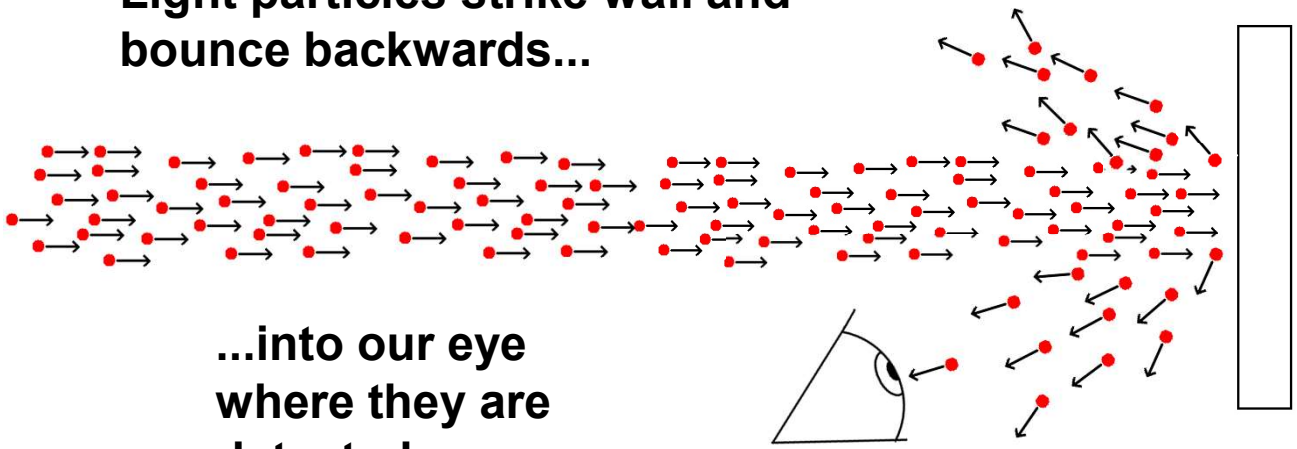


What is light? ...Two Models

Light as a particle (Photons):

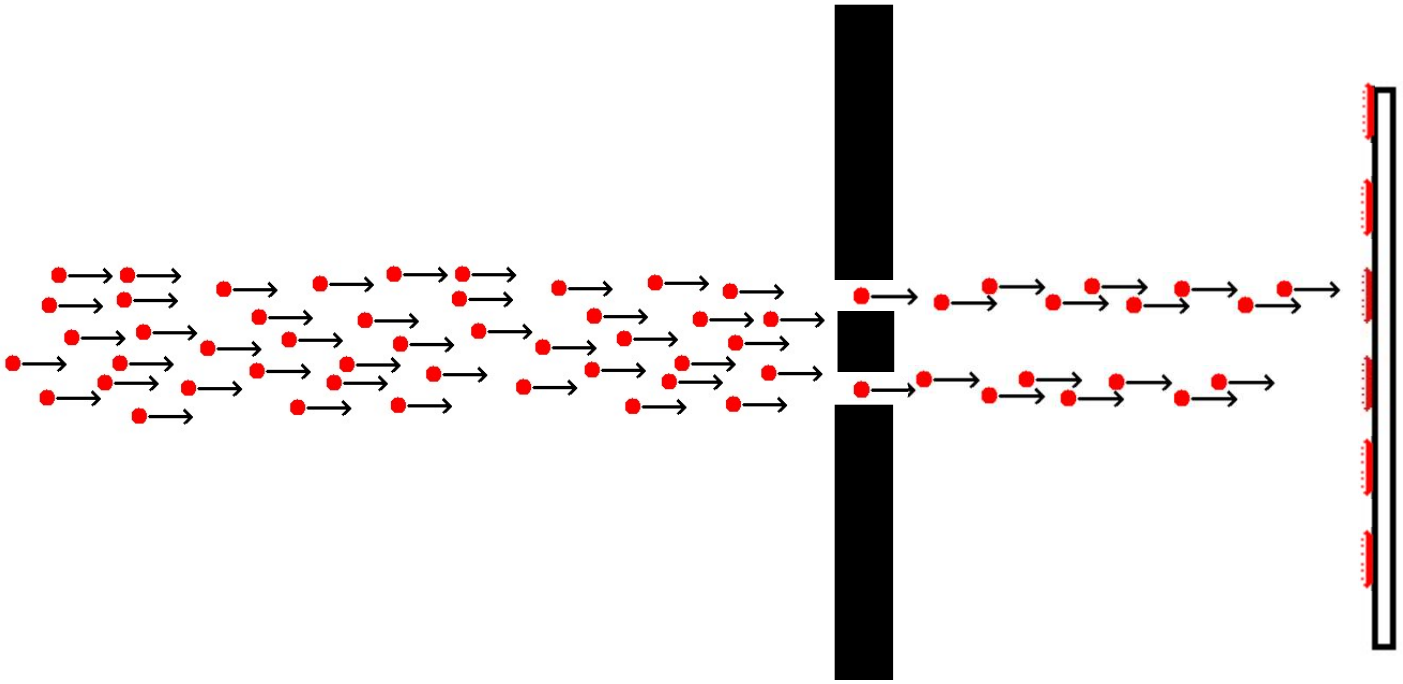


Light particles strike wall and bounce backwards...



...into our eye where they are detected.

Light particles: Another experiment.



Double Slit

Expected: Two Red Spots.

...but...

..many spots are observed!

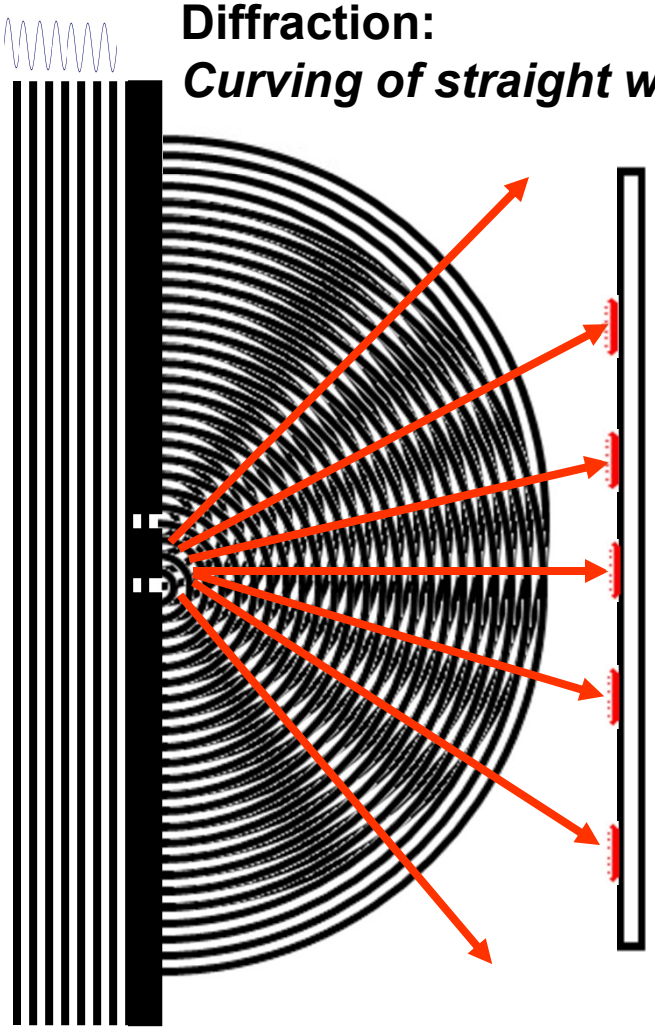
The particle (photon) model of light cannot explain this effect.

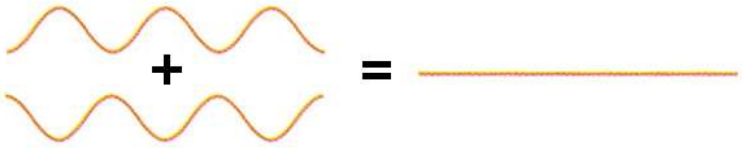
...another model/theory is needed!

Wave Interference...

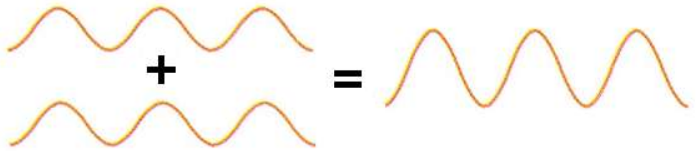
Light waves traveling to double slit...⇒

Diffraction:
Curving of straight wave Fronts





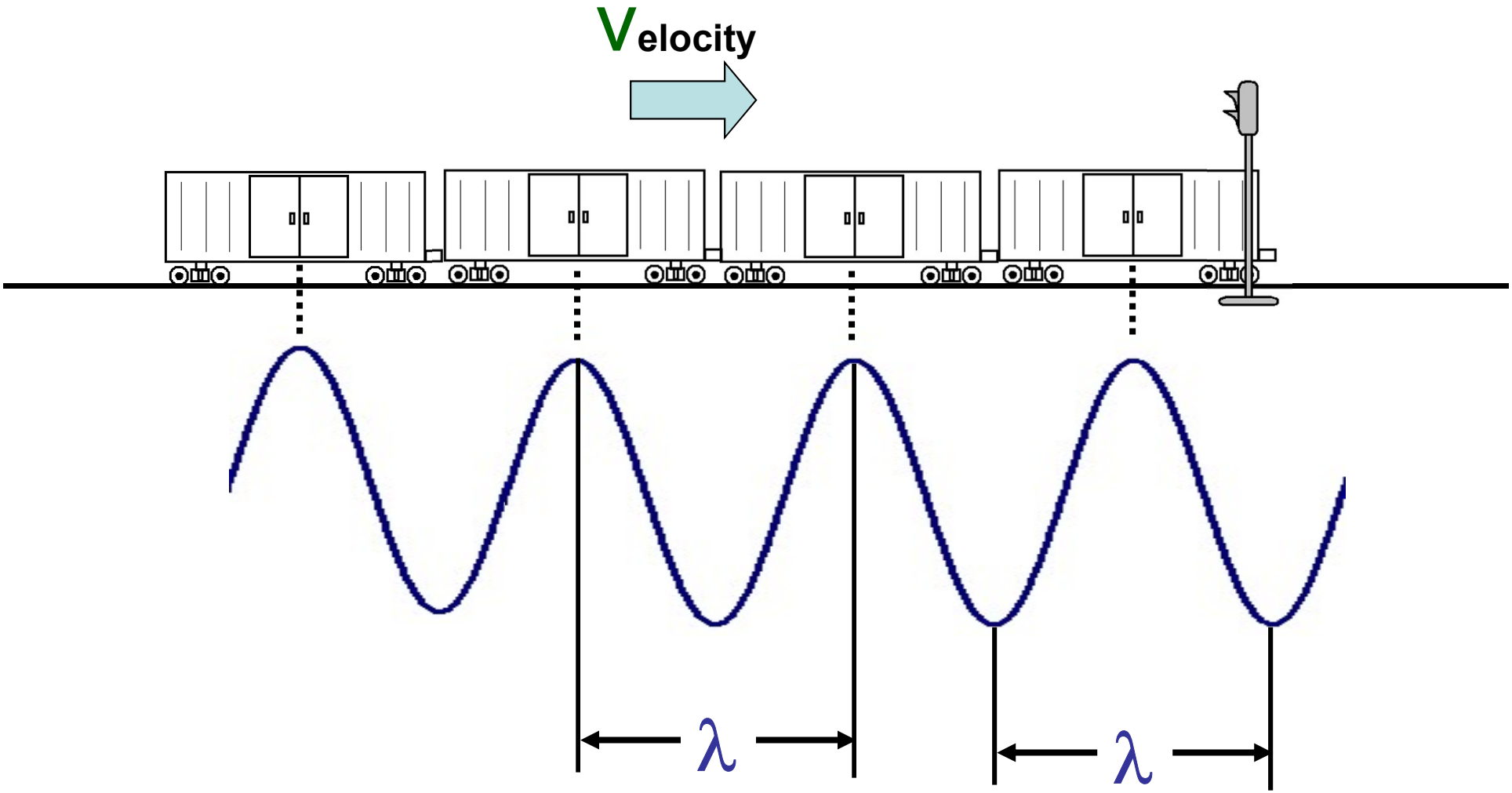
Waves out of phase...subtract



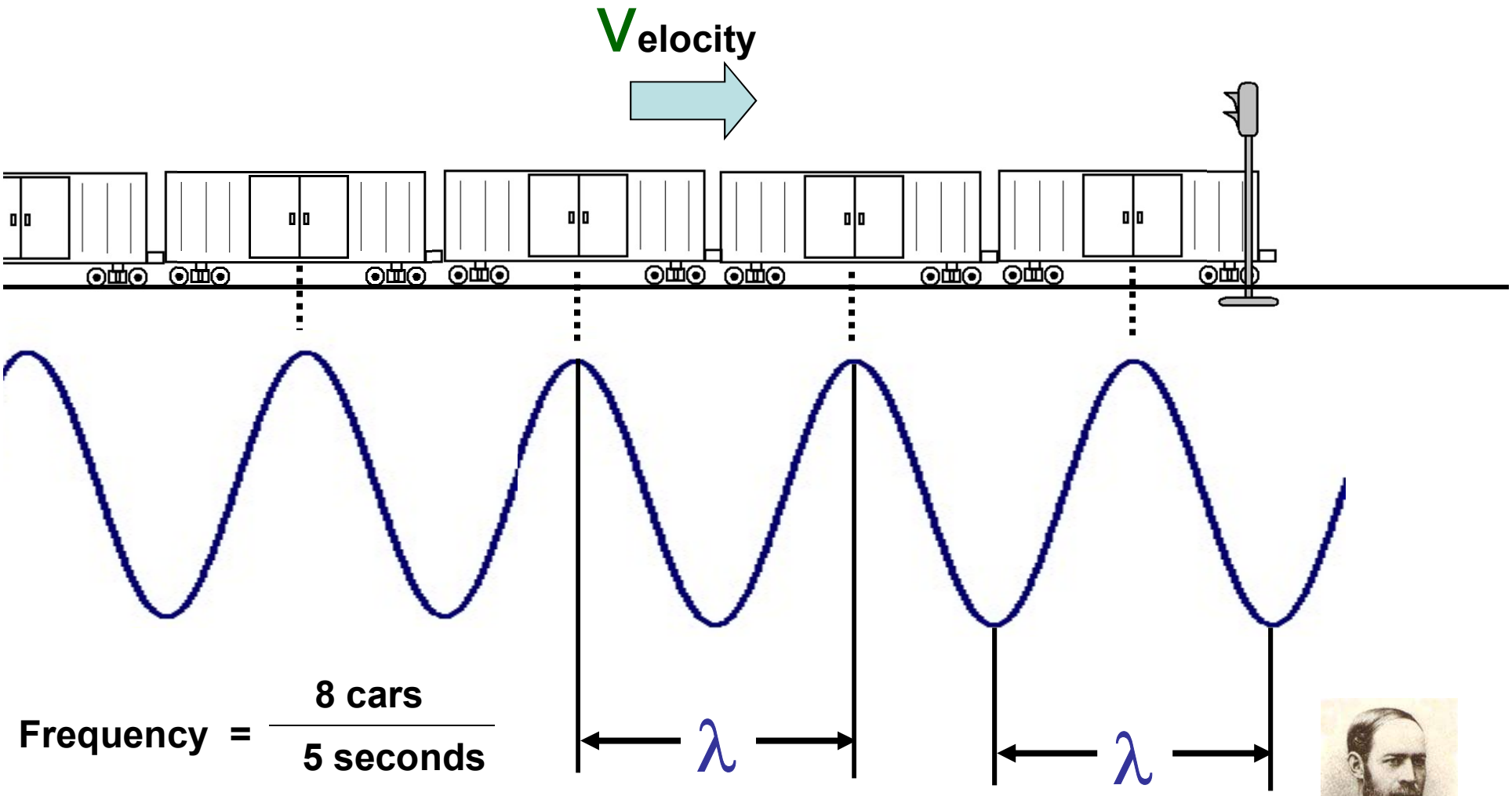
Waves in phase ...add together!

Multiple projected spots now possible with only two openings!

Characteristics of Waves



Characteristics of Waves



Frequency = $\frac{\text{8 cars}}{\text{5 seconds}}$

ν (nu) = 1.6 cars/second

= 1.6 waves/second

= 1.6 $^{1}/_{\text{second}}$

= 1.6 Hertz (Hz)

Heinrich Hertz

1 Hz = 1 $^{1}/_{\text{second}}$