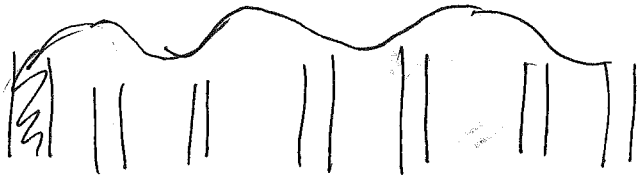


1. review
2. list what know about light, ~~matter~~ electrons (matter)
3. photo-electric effect
   ⟹ light is particles ⟶ who is ok w/ this?
   matter " " why or why not?
4. laser diffraction
   ⟹ light as waves
5. electron diffraction
   ⟹ matter as waves

~~How could we rectify these observations?~~

⟹ can perform double slit on electrons. see same pattern
⟹ if cover one of slits, lose interference

6. how can we rectify wave + particle?
   ⟹ slow motion
   ⟶ build interference
7. wavefunction = probability
8. measurement removes interference
9. duality
10. discussion – wave or particle?
11. calculations

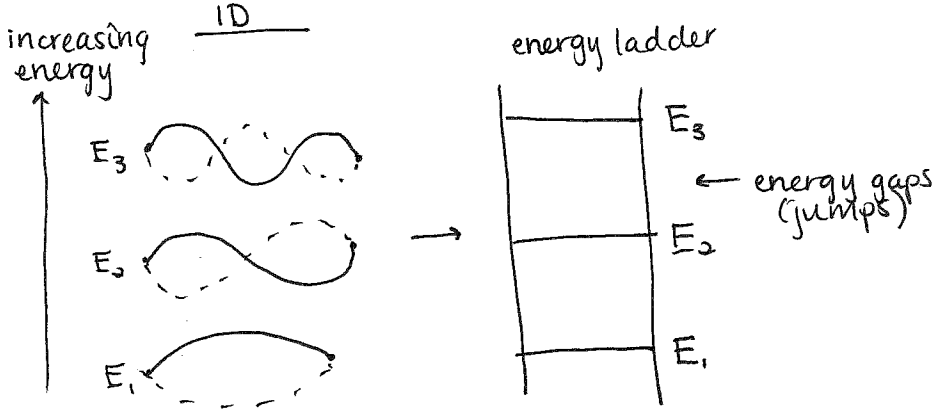
Review from Lec 1

(have students list key terms)

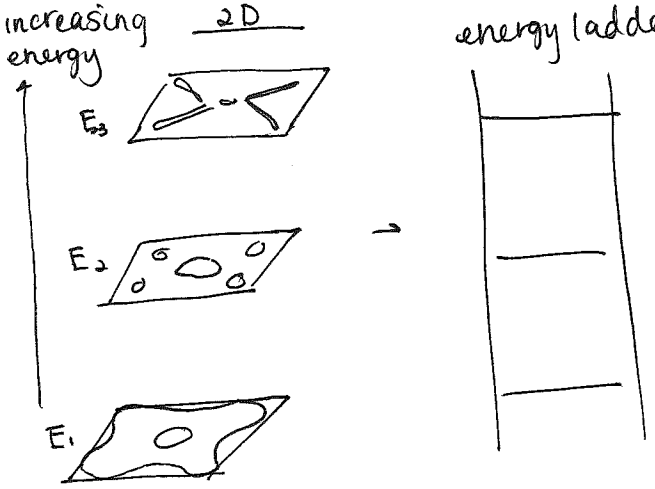
quantization: of/having a discrete set of values

Standing waves
Two examples:

1D



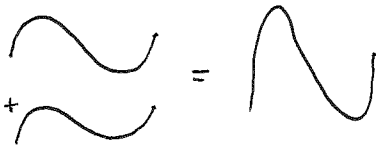
2D



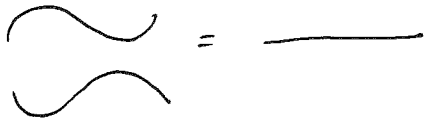
superposition: when two waves exist in the same location, they interfere w/ eachother. The resulting wave is the sum, or superposition, of the two individual waves

→ Two kinds of interference:

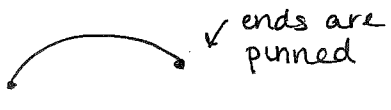
constructive:

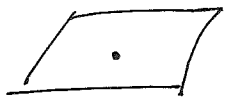


destructive:

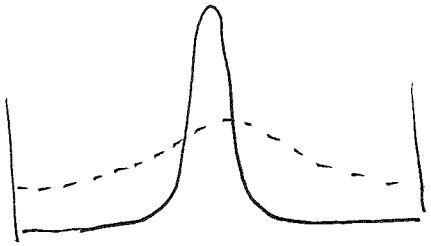


boundary conditions: the behavior of our system (string, plate, ripple tank...) b/c depends on what is happening at the boundaries





Diffusion

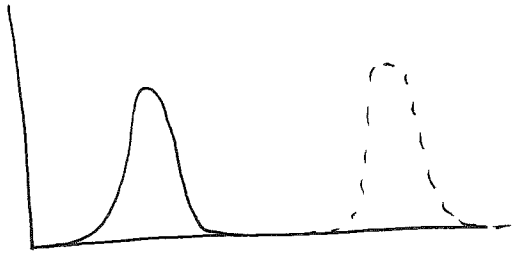


behavior: spreads out in time (delocalizes)

mathematically:

curvature ⟷ velocity
(position) (time)

Waves



behavior: travels w/out spreading out (stays localized)

mathematically:

curvature ⟷ acceleration
(position) (time)

same when:

stationary states (like standing waves that don't change in time)