

# Diffraction and Interference: The Double Slit Experiment

## Single Slit:

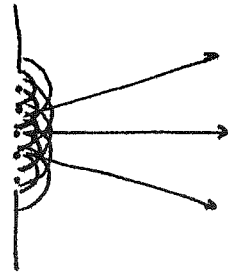
intensity  
(amount of light)  
←

what we saw  
on screen

small slit:

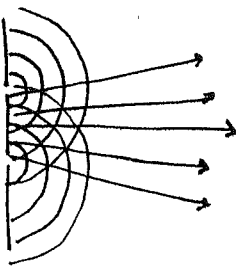


large slit

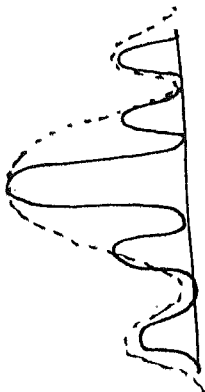


## Double Slit:

two  
small slits

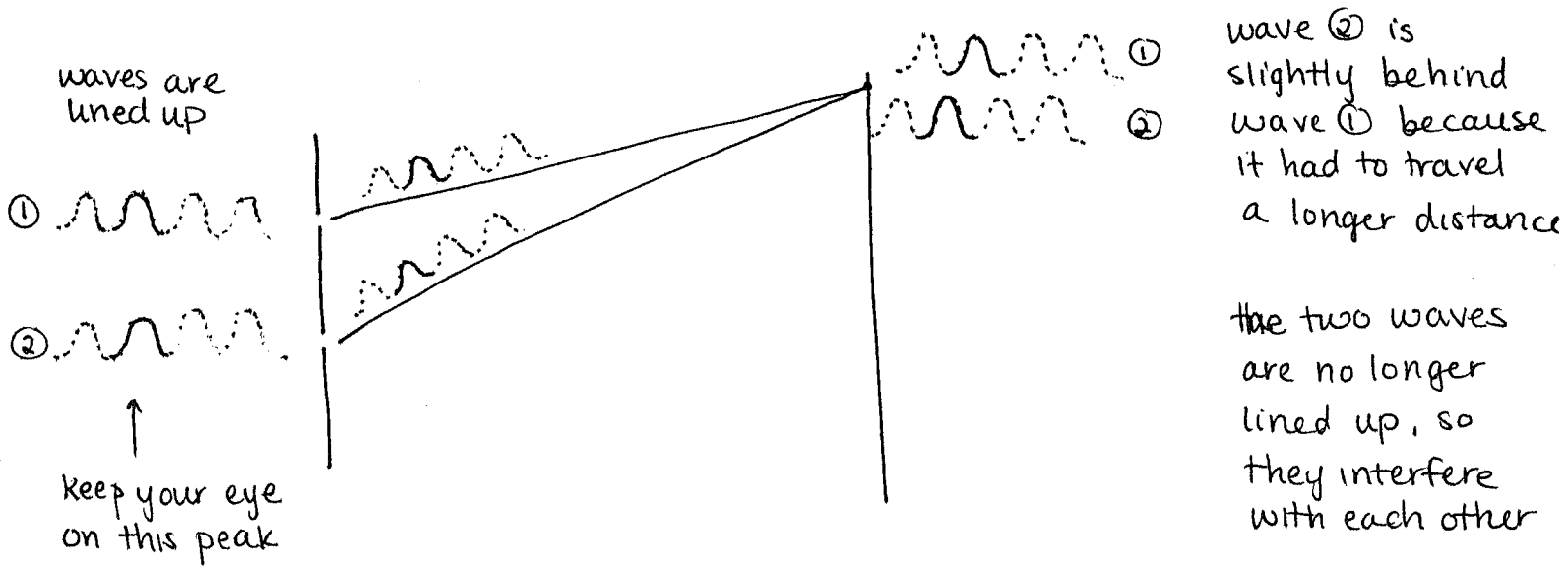


two  
large slits

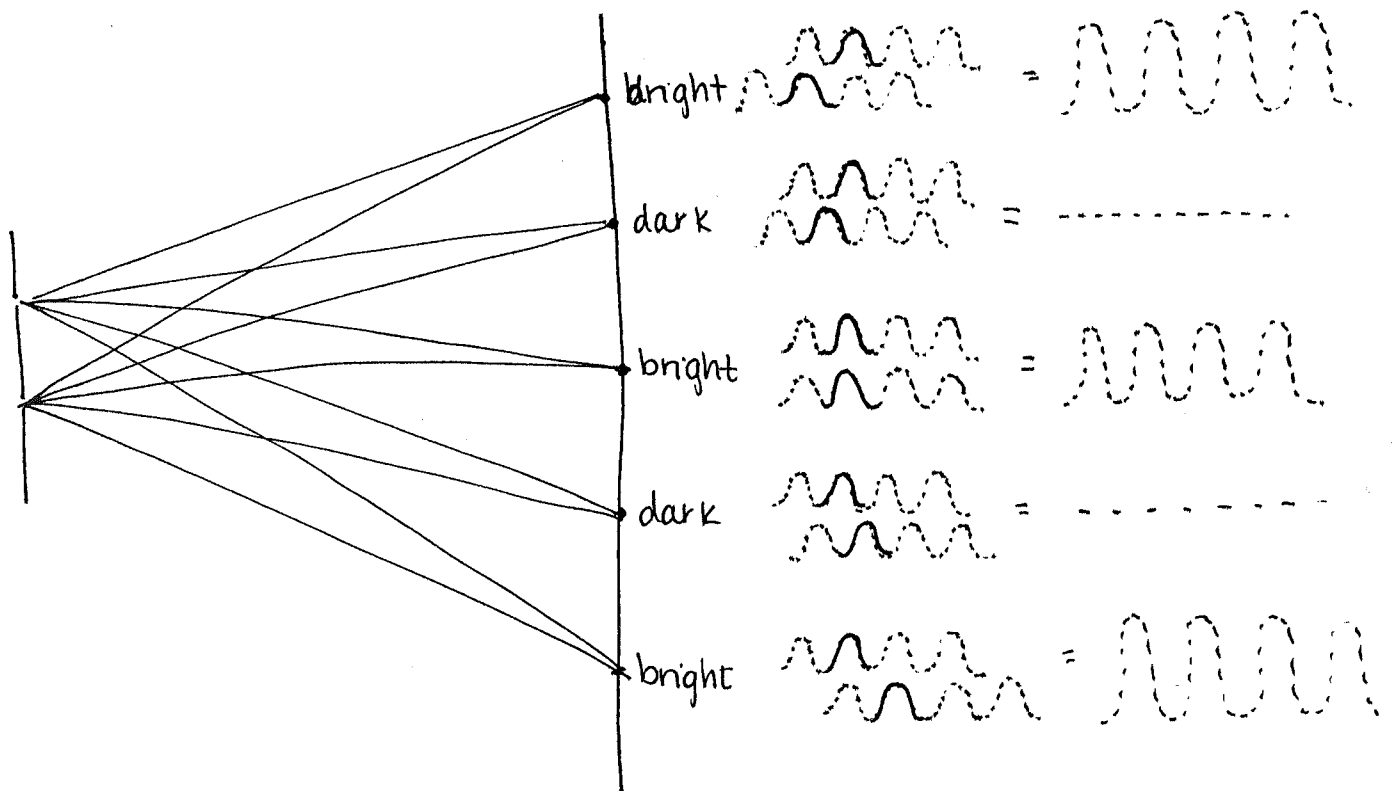


# Why do we see bright and dark spots?

Consider two small slits (you could do the same calculation for a single slit):



The bright and dark spots that we see depend on the interference between waves ① and ②



# Crystal Diffraction

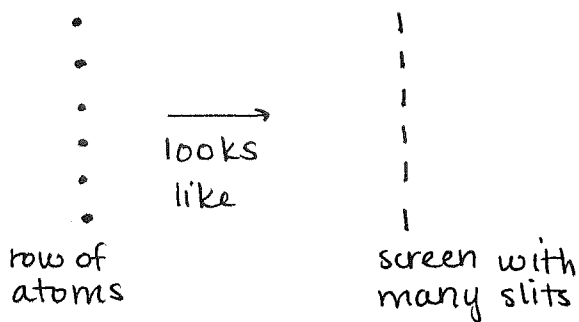
In a crystal, the atoms are spaced regularly, forming what we call a crystal lattice:



there are many different types of crystals that have different lattice structures

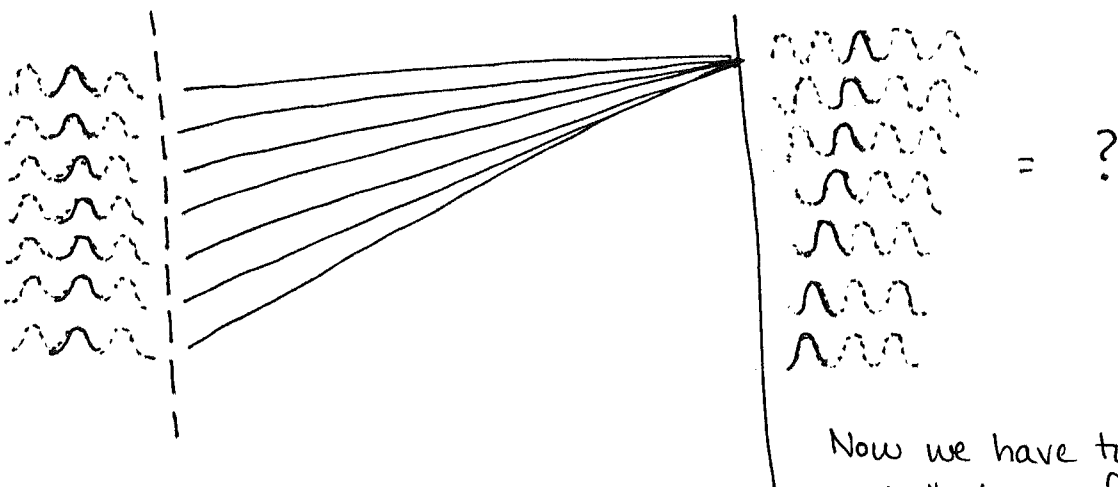
The spaces between atoms act like slits (just like the slits we used in our double-slit experiment)

consider one row of atoms:



space between atom = slit

If we send a wave through a screen with many slits, we see diffraction and interference (just as we saw with two slits)



Now we have to add up the contributions of many waves