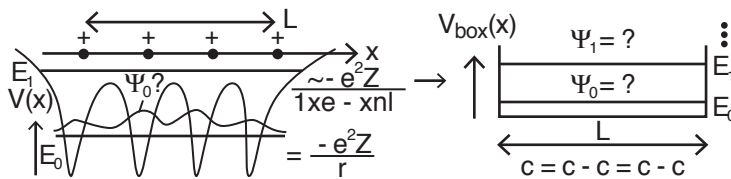
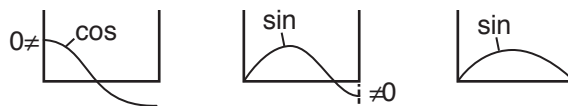


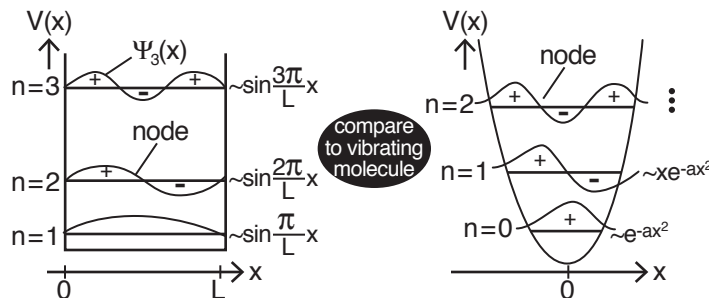
Today: let's do a different potential $V(x)$ besides the harmonic oscillator:
 A box-shaped potential is a useful approximation for electrons bound by nuclei in many cases.



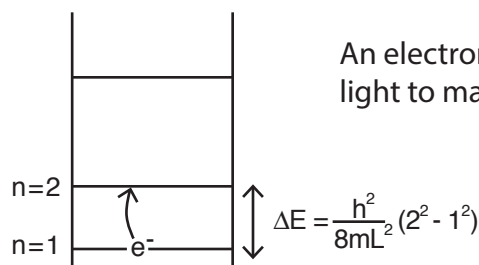
Not just any sin or cos function can be an eigenfunction of the particle in a box. $\Psi(x)$ must be zero outside the box (where $V(x)=\infty$), so it has to go to zero at the borders of the box:



The eigenfunctions of the particle in a box are not all that different from the vibrating molecule = harmonic oscillator; after all, they are both boxes, one with a 'hard' wall, one with a 'soft' wall.



As a matter of tradition, people like to start the counting of energy levels with $n=1$ for the box, $n=0$ for the oscillator.



An electron in a box can absorb light to make a transition.