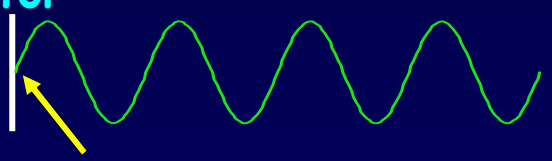
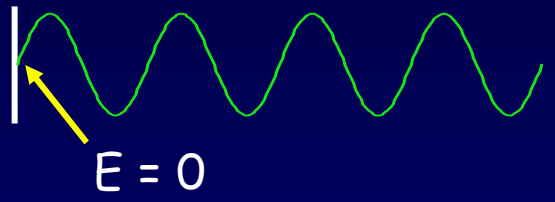
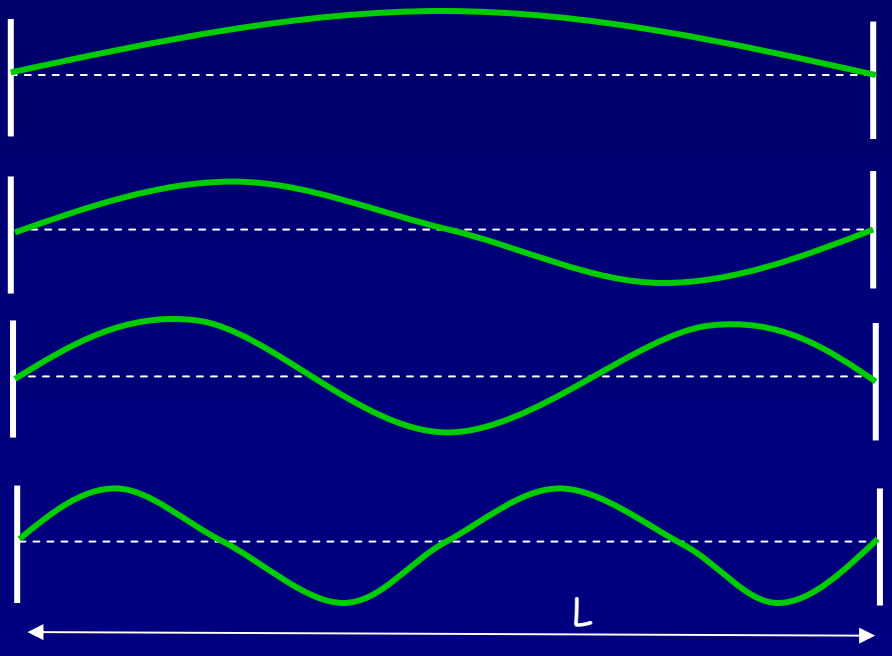
Boundary conditions → Standing waves

- **A standing wave is the solution for a wave confined to a region**
- Boundary condition: Constraints on a wave where the potential changes
  - **Displacement = 0 for wave on string**
  - **E = 0 at surface of a conductor**





- If *both* ends are constrained (e.g., for a cavity of length L), then only certain wavelengths λ are possible:



n	λ	f
1	2L	v/2L
2	L	v/L
3	2L/3	3v/2L
4	L/2	2v/L
n	2L/n	nv/2L

$$n\lambda = 2L$$

n = 1, 2, 3 …
'mode index'