

Changing Coordinate Systems

- Our default coordinate system until now is y vertical, x horizontal
- For many problems, only one interesting direction, but not purely horizontal or vertical
- Trick: align coordinate system so “interesting” direction is along coordinate
 - If you do it right, no need to worry about forces/motion in one of the dimensions
 - Ex: ramp

Constraints

- Sometimes multiple objects are stuck together or tied together
- Can still analyze forces by relating accelerations (magnitude the same)
- Can use separate coordinate systems for each part—as long as you relate the acceleration components carefully!
 - Ex: block on a ramp with pulley

Centripetal Force

- Centripetal force is the net force necessary to make an object go in a circle $F_c = m \frac{v^2}{r}$
 - Corresponds to m times centripetal acceleration
 - Formula only gives magnitude—direction is toward center of circle
 - This force is not a new force, it's just the result needed from all other forces to go in a circle