

UNIT V - Constant force particle model

What you should know when all is said and done

By the time you finish all labs, worksheets and related activities, you should be able to:

1. Use Newton's 2nd Law to qualitatively describe the relationship between \mathbf{m} and \mathbf{a} , \mathbf{F} and \mathbf{a} , \mathbf{m} and \mathbf{F} . (e.g., if you double the mass, the acceleration will)
2. Given a \mathbf{v} vs \mathbf{t} graph, draw the corresponding \mathbf{a} vs \mathbf{t} and \mathbf{F} vs \mathbf{t} graphs.
3. Determine the net force acting on an object by:
 - a. drawing a force diagram for an object given a written description of the forces acting on it.
 - b. resolving forces into \mathbf{x} and \mathbf{y} components, then finding the vector sum of the forces.
 - c. analysis of the kinematic behavior of the object.
4. Solve quantitative problems involving forces, mass and acceleration using Newton's 2nd Law.
 - a. Having determined the net force (as in #3), and given the mass, find the acceleration.
 - b. Continue to use the kinematical models from unit III to determine the velocity or displacement of the object, once the acceleration is known.