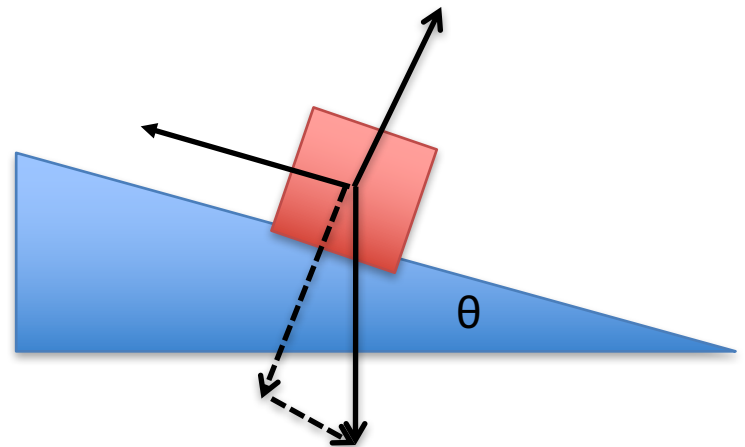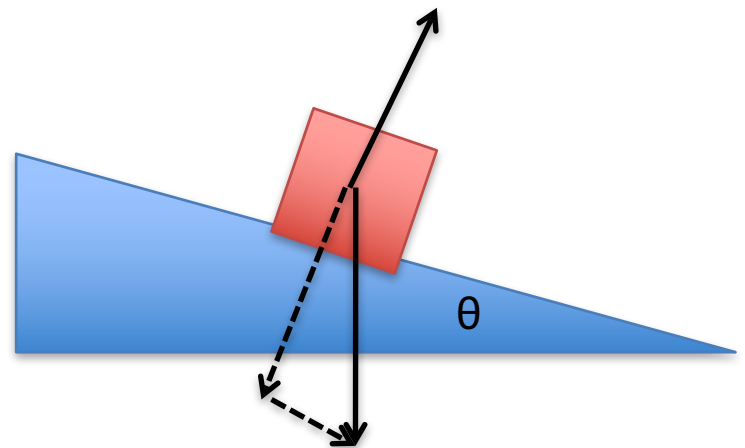# Inclined Planes with Friction

# Inclined Planes

- These are two dimensional problems.  The coordinate axis is tilted down the incline, therefore all motion is on the x-axis.  $a_y = 0$.

- X-axis: used to find acceleration

- Y-axis: used to find normal force

**A block slides down an incline.**

**What are the forces acting on it?**

- **Ex:** No friction

θ

- **Ex:** With friction

θ

A 4 kg crate slides down an incline of $15^0$. The coefficient of friction between the crate and the incline is 0.45. What is the acceleration of the crate?

A 5.0-kg block is pushed up an inclined plane with a force of 40.0 N parallel to the plane. The coefficient of friction is 0.3. What is the acceleration of the block if the plane is inclined at 20.0°?

The block is now released from rest at the top of the inclined plane. How fast is it traveling after sliding 3.0 m?

What force is needed to keep a block of mass 6 kg at rest on an incline of $20^0$ with coefficient of friction between the surfaces of 0.3?