• Label the direction of N and mg.



Use slide show mode (press F5) for animations.

• Mark the direction of acceleration a.



 Choose the coordinate system with x in the same or opposite direction of acceleration and y perpendicular to x.



• Now some trigonometry



• Replace the force of gravity with its components.



Use Newton's second law for both the x and y directions



$$\Sigma F_x = ma_x = -ma$$
$$\Rightarrow -mg\sin\theta = -ma$$
$$\Sigma F_y = ma_y = 0$$
$$\Rightarrow N - mg\cos\theta = 0$$

The force and acceleration in the x-direction have a negative sign because they point in the negative x-direction.

- Why is the component of mg along the x-axis –mgsin $\theta$
- Why is the component of mg along the y-axis  $-mgcos\theta$



- Why is the component of mg along the x-axis:  $-mgsin\theta$
- Why is the component of mg along the y-axis:  $-mgcos\theta$



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- Why is the component of mg along the x-axis:  $-mgsin\theta$
- Why is the component of mg along the y-axis: –mgcosθ

