

# SiQuENC: Newtonian dynamics for linear motion

## Neatly and graphically represent situation(s)

Carefully read the problem three times.

Draw system and relevant aspects of environment.

**B** – Use dashed bubble(s) to indicate object(s) in system (right now).

Identify requested unknowns.

## Graphically represent quantities and their relationships

### Free-body diagram

**E** – Is the **E**arth nearby (right now)?

**T** – Is anything **t**ouching the system (right now)?

**A** – Draw **a**xes (indicate  $+x$  and  $+y$  directions)

## Identify relevant allowed starting point (in) equation(s) including Newton's laws (stated at bottom row)

	Force	$F_x$	$F_y$
1			
2			
3			
4			
5			
6			
7	$\Sigma$	$ma_x$ (is $a_x = 0$ ?)	$ma_y$ (is $a_y = 0$ ?)

## Analyze

## Communicate

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**Example:** Complete a force component chart for a block resting on a rough plane inclined at an angle of  $\theta$  above the horizontal.

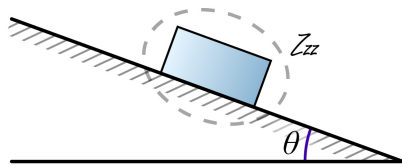
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?: FBD

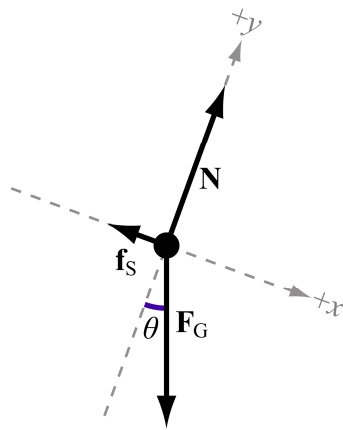
## Graphically represent quantities and their relationships

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## Identify relevant allowed starting point (in)equations

Including Newton's laws (stated at bottom row)

	Force	$F_x$	$F_y$
1	$\vec{F}_G$	$+F_G \sin \theta$	$-F_G \cos \theta$
2	$\vec{N}$	0	$+N$
3	$\vec{f}_s$	$-f_s$	0
4			
5			
6			
7	$\Sigma$	$ma_x$ (is $a_x = 0$ ?)	$ma_y$ (is $a_y = 0$ ?)

## Analyze

## Communicate