NAME _____ DATE _____

## Scenario

*An apparatus to determine the coefficients of friction is shown to the right. The box is slowly rotated counterclockwise. When the box makes an angle* $\theta$ *with the horizontal, the block of mass* m *just starts to slide, and at this instant, the box is stopped from rotating. Thus, at angle* $\theta$, *the block slides a distance* d, *hits the spring of force constant* k, *and compresses the spring a distance* x *before coming to rest.*

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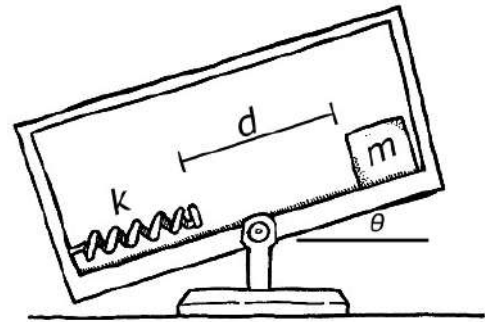


## Data Analysis

PART A: Draw qualitative energy bar charts that represent the energy of the block-Earth-spring-box system at the locations indicated.



$K \quad U_g \quad U_s$       $K \quad U_g \quad U_s \quad E_{therm}$       $K \quad U_g \quad U_s \quad E_{therm}$

Initial position       $X=d$       $x=x_s$

## Argumentation

PART B: In a subsequent experiment, a second block with a mass $2\,m$ is subjected to the same conditions as the original block. This new block is made of the same materials as the first block. Indicate how the values of the quantities below would change in the second experiment.

$v$     .........   _____ Increase   _____ Decrease   _____ Remain the same

Justify your selection, reasoning in terms of energy.

_____

_____

_____

_____

_____

_____

$x_s$     .........     _____ Increase     _____ Decrease     _____ Remain the same

Justify your selection.

_____

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