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MATERIALS:
pegboard
incline plane
metal looped hook
Kinex cart
(see assembled setup in picture)

## OBJECTIVE:

To observe the amount of work done by lifting the cart straight up versus the amount of work done by using the inclined plane at varying heights.

PREDICTION: Would the work you do pulling the cart up the incline be more than, less than, or the same as the work needed to lift the cart 0.20 meters?

INVESTIGATION:
We want to know how much work is done to lift a cart 0.20 meters.

1. What is the equation for work? $\qquad$
2. Force exerted by cart= $\qquad$ Distance the cart is lifted= $\qquad$ Work done to lift cart= $\qquad$
We want to know how much work is done by using an inclined plane to lift a cart to a height of 0.20 meters. Use the chart below to record your data.

| PEG HOLE HEIGHT | EFFORT FORCE ( $\mathbf{N}$ ) | EFFORT DISTANCE ( $\mathbf{m}$ ) | WORK DONE ( $\mathbf{J}$ ) |
| :---: | :---: | :---: | :---: |
| 12 |  |  |  |
| 14 |  |  |  |
| 16 |  |  |  |
| 18 |  |  |  |
| 20 |  |  |  |

## ANALYSIS QUESTIONS:

1. How does the force and distance change as you increase the peg hole height?
2. How does the amount of work change to lift the cart as you increase the height of the inclined plane?
3. What are the trade-offs for force and distance when using the inclined plane as an effective simple machine?
