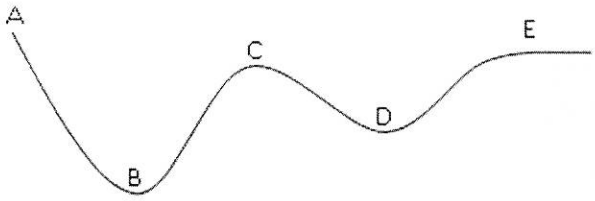
Energy Skate Park PhET Simulation

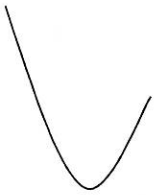
Playground

Create the skate paths as shown. If the skater starts on the left side, will he have enough energy to make it all the way to the right side? _____ Why or why not?



If the skater starts on the left on the path here, match the letter here with the following conditions:

1. Maximum kinetic energy _____
2. Maximum potential energy _____
3. Two locations where the skater has about the same speed _____



If the skater starts at the top of the ramp on the left, show how high will he be on the right side of the ramp. Let the skater go down the ramp. Does she get back to the original height? Explain why this happens in terms of types of energy.

Try to make a Loop da Loop. Move the skater around and determine a relationship between where the skater starts and whether he makes the loop or not. Record your ideas below.

<u>Conclusion Calculations:</u> ***use g = 10.0 m/s²***

Complete the table of kinetic and potential energies:

Mass of skater (kg)	Height (m)	Velocity (m/s)	K (J)	U_{grav} (J)	Mechanical Energy (J)
20	14	12	1440	2800	4240
60	6.0	8	1920	3600	5520
0.20	-18	20	40	-36	4
10	6.0	5.0	125	600	725

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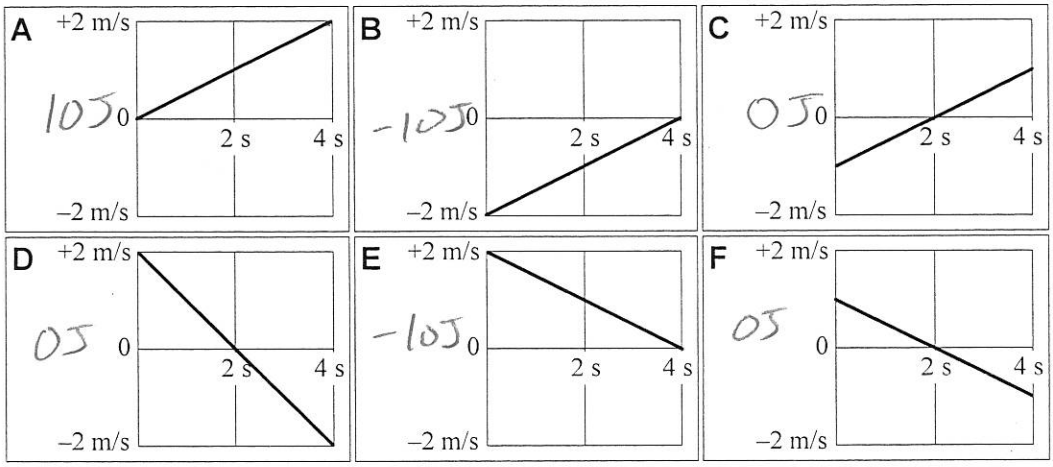
Work is the amount of energy added or removed from a system. Most of the time, to find the work, it is easiest to focus on the energy that is being changed, instead of going straight to the work equation.

1. Shown below are graphs of velocity versus time for six identical objects of mass 5 kg, that move along a straight, horizontal surface. A single external force acts on each object.

$W = \Delta KE$

$= \frac{1}{2}m(v_f^2 - v_i^2)$

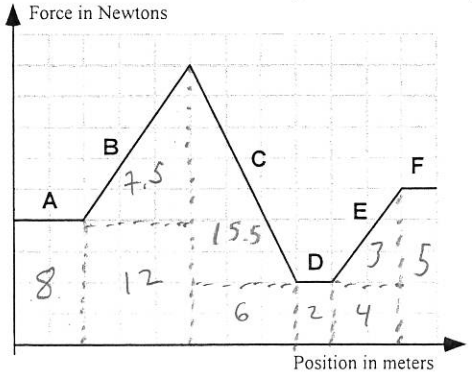


Rank (from greatest to least) the work done on the objects by the external force during the 4-second time interval shown.

Greatest 1 A 2 C 3 D 4 F 5 B 6 E Least

If given a Force vs displacement graph, to find the work done on the system, $W = F\Delta x$, which of the 3 aspects of a graph (coordinates, slope or area) would we focus on?

1. The graph below shows the force that an employee exerts on a cart loaded with wood at a lumberyard. This force varies as a function of position. Six segments are marked in the graph.



A = 8
B = 19.5
C = 21.5
D = 2
E = 7
F = 5

Rank these segments from greatest to least on the basis of the energy the employee transfers to the cart.

Greatest 1 C 2 B 3 A 4 E 5 F 6 D Least