Name: _____

Period: _____

Unit 8:2

15

1. Energy B	A. The units for work and energy.
2. Joules A	B. Stored or gained work.
3. Work D	C. Energy changing from one form to another.
4. Power E	D. Energy transferred by forces. Product of force and distance.
5. Energy Transfer C	E. How fast work is done.

Is energy increased or decreased?

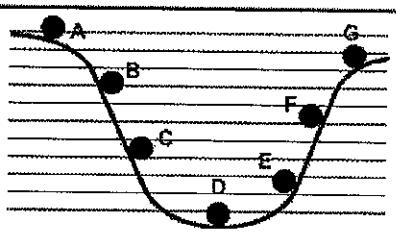
- I An object speeds up.
- D An object is lowered back to the ground.
- D Friction slows down an object.
- neither An object sits motionless on a table.
- I An object is lifted up from the ground.

Potential Energy (E_p), Kinetic (E_k) Energy, or Work (W)

- W An object is pushed for 3 m. (pushed = force)
- E_K An object is going 6 m/s.
- W Slowing down an object.
- E_P An object on top of a 3 meter table.
- W Friction stopping an object from moving. Friction is force

What kind of energy is lost from A to D? potential

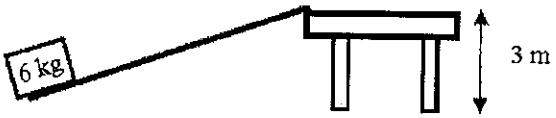
What kind of energy is lost from D to G? kinetic



To help a bicyclist get to the top of a hill, they speed up. Using energy, explain why this helps. To store up most E_K. (converts to E_P)

If the bicyclist starts at rest, how do they get up the hill?

need to use work.



What kind of energy will it have at the top? E_P

Calculate it. $E_P = mgh$

$= 6(10)(3) = 180$ J

Where does this energy come from? work (at least 180 J)

Motor A does 240 J of work in 24 seconds. Calculate power.

$w = 240$ J, $t = 24$ s, $P = $ ___

$P = \frac{w}{t} = \frac{240}{24} = 10$ watts

Motor B does 240 J of work in 8 seconds. Calculate power.

$w = 240$ J, $t = 8$ sec, $P = $ ___

$P = \frac{w}{t} = \frac{240}{8} = 30$ w

Which motor did more work? same

Which motor was more powerful? B

True or false: "*A more powerful motor does more work*"?

Powerful motor does work faster

Figure out the Energy Transfers.
Thermal; Nuclear; Radiant; Mechanical; Chemical; Electrical

Eating food allows you to move.

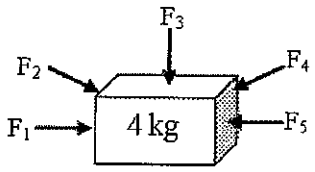
chemical becomes mech.

A gas stove boiling water.

chemical → thermal

Which forces are doing work on the object? F_1, F_2, F_4, F_5

Which forces are not doing work on the object? F_3



A person holds onto a 25 N object for 2 minutes 3 m above the ground. How much work is done on the object?

0 J (didn't move)

A 30 N force pushes a 20 kg box 5 m across the floor. How much work is done on the box?

$w = Fd$

$w = 30(5) = 150$ J

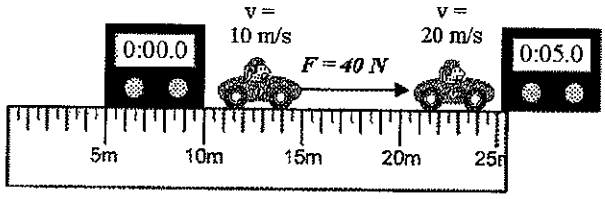
What did the above work become? E_K

A 25 N force pushes a box up a ramp to the back of a truck. If the force does 200 J of work, how long is the ramp?

$w = Fd$

$200 = 25(d)$ $\frac{200}{25} = d$ $d = 8$ m

Where does the work go? E_P



Calculate the work done on the car.

$F = 40$ N $w = Fd = 40(10) = 400$ J

$d = 10$ m

Calculate the power of the force.

$w = 400$ J $P = \frac{w}{t} = \frac{400}{5} = 80$ watts

$t = 5$ sec

What did the work become? more E_K