

P. 365
1.

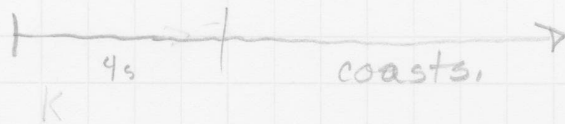
- Kinetic energy of air
- Radiant energy
- Elastic potential energy
- Chemical energy

2.

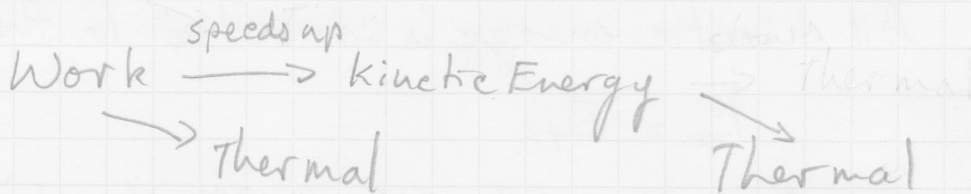


$$v = 20 \text{ km/h} = 5.56 \text{ m/s}$$

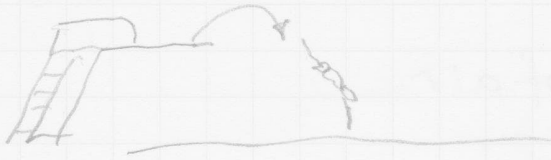
$$\Delta t = 4 \text{ s}$$



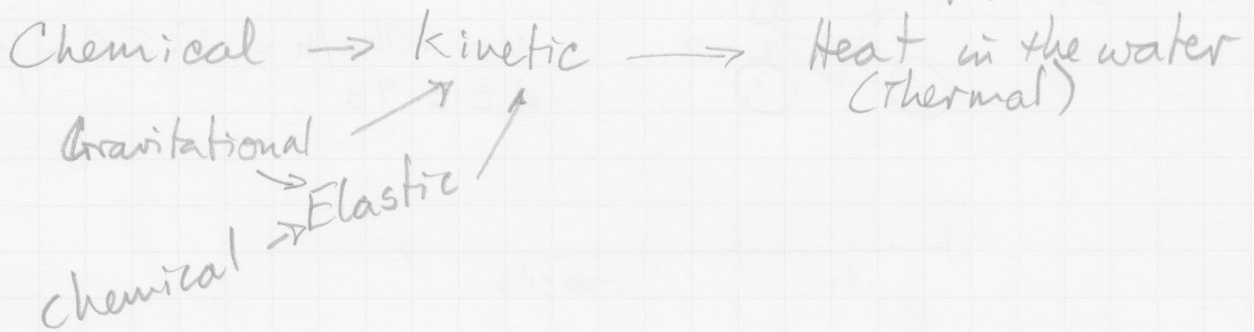
Kinetic energy in the motion of the bike.
 The work ~~needed~~ ^{needed} to increase the velocity to 5.56 m/s.
 The thermal energy from the friction force that slows the bike down.



3.



- Gravitational energy -
- Kinetic energy - motion of diver
- Elastic energy - spring board
- Chemical energy - muscles of diver.
- Buoyancy force stores energy as diver goes under water.
- Heat energy



4. Electric current produces radiant light energy & heat (Thermal energy).

5. $m = 0.170 \text{ kg}$
 $v = 10 \text{ m/s}$

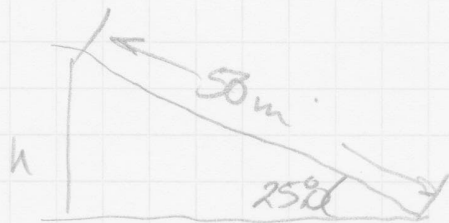
All kinetic energy is converted to thermal energy.

$$E_k = E_{th}$$

$$E_k = \frac{1}{2} m v^2 = \frac{1}{2} (0.170 \text{ kg})(10 \text{ m/s})^2 = 8.5 \text{ J}$$

$$E_{th} = 8.5 \text{ J}$$

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$$h_i = 50 \text{ m} \sin 25^\circ = 21.13 \text{ m}$$

$$v_i = 0 \text{ m/s}$$

$$h_f = 0 \text{ m}$$

$$v_f = 12.0 \text{ m/s}$$

$$E_{mi} = E_{mf} + E_{th}$$

$$mgh_i + \cancel{\frac{1}{2} m v_i^2} = mgh_f + \cancel{\frac{1}{2} m v_f^2} + E_{th}$$

$$E_{th} = mgh_i - \frac{1}{2} m v_f^2$$

$$= (60 \text{ kg})(9.8 \text{ m/s}^2)(21.13 \text{ m}) - \frac{1}{2}(60 \text{ kg})(12.0 \text{ m/s})^2$$

$$E_{th} = 8,104 \text{ J}$$