*Conservation of Mechanical Energy Flowchart*

Use this procedure when an object moves from one location to another AND there are no forces on the object **other than** gravity, normal force, or spring force. Also use this method for an object that swings on a rope like a pendulum.

*ME at time or position I*

*ME at time or position II*

=

*MEI* = *KEI* + *GPEI* + *EPEI*

*MEII* = *KEII* + *GPEII* + *EPEII*

*KEI* = ½ mVI2

*GPEI* = mghI

*EPEI* = ½ kXI2

*KEII* = ½ mVII2

*GPEII* = mgh*II*

*EPEI* = ½ kXII2

***symbols in equations***

*m* – mass of object in kg

*V* – speed of the object in m/s

*g* – acceleration due to gravity = 9.8 m/s2

*h* – how high the object is above the zero GPE level in m

*k* – force constant of a spring or spring constant in N/m

*X* – how far the spring is stretched or compressed from its

equilibirum length in m

If the system object moves **at constant speed** then eliminate the *KE’s*.

If the system object does **not change height** then eliminate the *GPE’s*.

If the situation does **not have a spring** then eliminate the *EPE’s*.

If the problem does not tell you the mass of the object then

**assign a mass**. 1 kg, 2 kg, or 10 kg are good choices.

OR

**leave the mass as a symbol**. The *m’s* will cancel during the algebra.