Name: _____   Period: _____   Date: _____

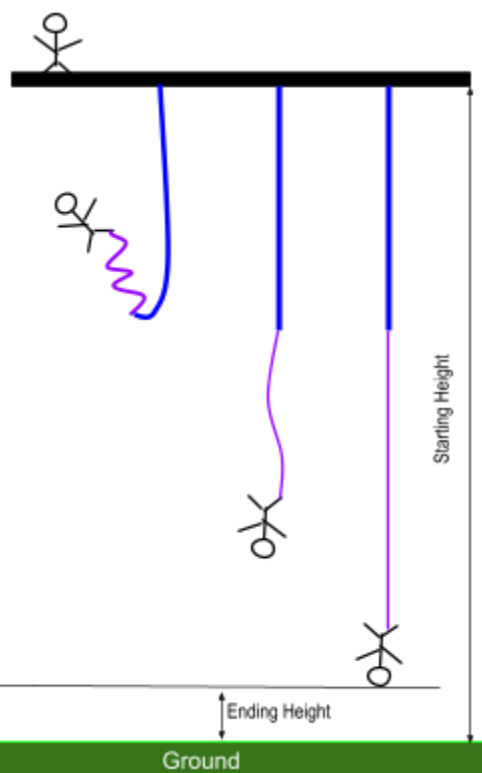$$E_{\text{Total before}} = E_g + E_k + E_e = E_{\text{Total after}} \qquad E_g = mgh \qquad E_k = \tfrac{1}{2} m v^2 \qquad E_e = \tfrac{1}{2} k d^2 \qquad g = 10 \text{ N/kg}$$

1. A jumper with a mass of 0.4 kg is on top of a 6 meter tall platform. The bungee cord has a spring constant of k = 20 N/m.
   A) Fill in the missing bar charts below.
   B) Calculate the missing Eg at each point.
   C) Determine the missing Ek and Ee at each point.

System Component: Jumper   Bungee Cord   Total System

Position 1: (6 m)

Eg =
Ek =
Ee =

Position 2: (4 m)

Eg =
Ek =
Ee =

Eg =
Ek =
Ee =

Position 3: (1.5 m)

Eg =
Ek =
Ee =   stretch = 0.5 m

Position 4: (0.5 m)

Eg =
Ek =
Ee =

E) Determine the stretch at Position 4 (ending height) and clearly communicate your calculations:

F) *Challenge Question:* In reality, some of the energy during a bungee jump is lost to thermal energy. If 20% of the energy during the fall transfers to thermal energy in the spring argue from your predicted data what will change in the jump. (Use the extra bar chart provided as a tool to assist your thinking

<u>New bar chart for position 4</u>