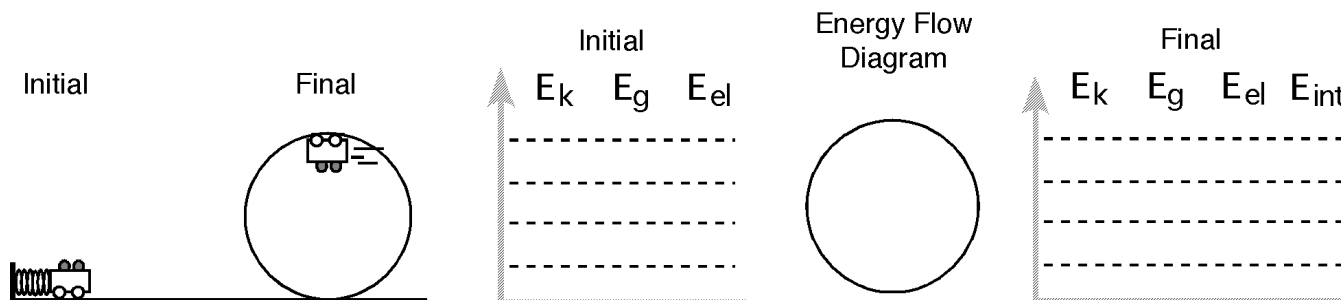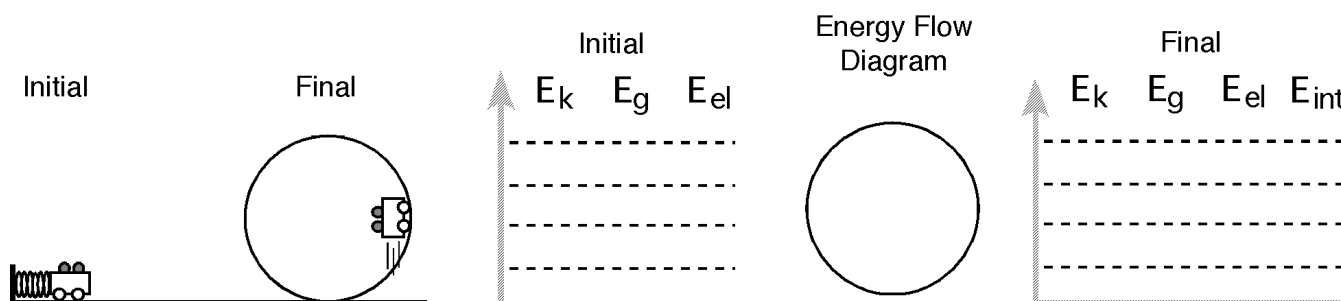Name_____

Date _____ Pd____

Unit VII: Worksheet 3a

For each situation shown below:
1. Show your choice of system in the energy flow diagram, unless it is specified for you.
   Always include the earth in your system.
2. Decide if your system is frictionless or not, and state this.
3. Sketch an energy bar graph for the initial situation.
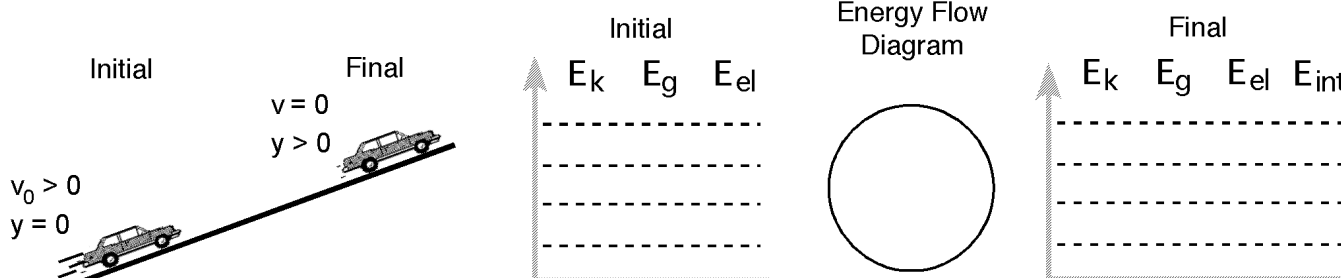4. Then complete the analysis by showing energy transfers and the final energy bar graph.

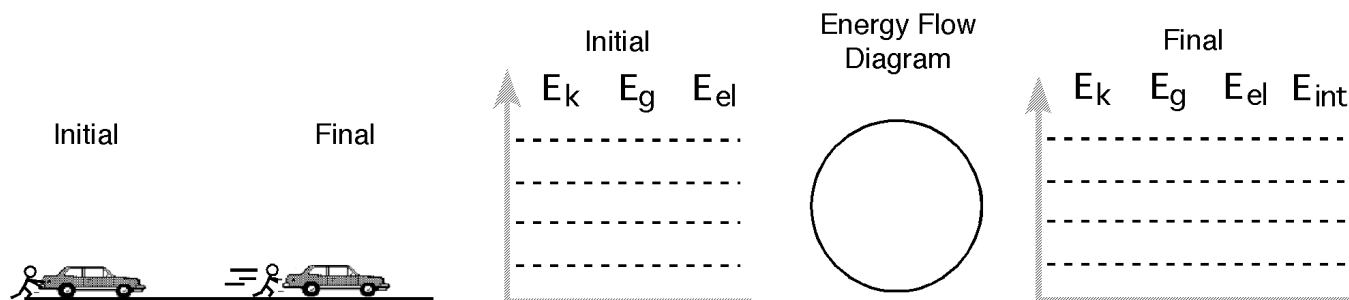1.   A car on a roller coaster track, launched by a huge spring, makes it to the top of the loop.

Initial   Final

Initial
E_k E_g E_{el}

Energy Flow
Diagram

Final
E_k E_g E_{el} E_{int}

2.   The same car is launched by the spring, but it is only half way up the loop.

Initial   Final

Initial
E_k E_g E_{el}

Energy Flow
Diagram

Final
E_k E_g E_{el} E_{int}

3.   A moving car, moving up a hill, coasts to a stop up.

Initial   Final
                    $v = 0$
                    $y > 0$

$v_0 > 0$
$y = 0$

Initial
E_k E_g E_{el}

Energy Flow
Diagram

Final
E_k E_g E_{el} E_{int}

4. A person pushes a stalled car to get it to the service station.

Initial   Final

Initial
E_k E_g E_{el}

Energy Flow
Diagram

Final
E_k E_g E_{el} E_{int}

5. A load of bricks, resting on a compressed spring, is launched into the air.

Initial   Final

v > 0

y=0
v=0

0

Initial
E_k E_g E_{el}

Energy Flow
Diagram

Final
E_k E_g E_{el} E_{int}
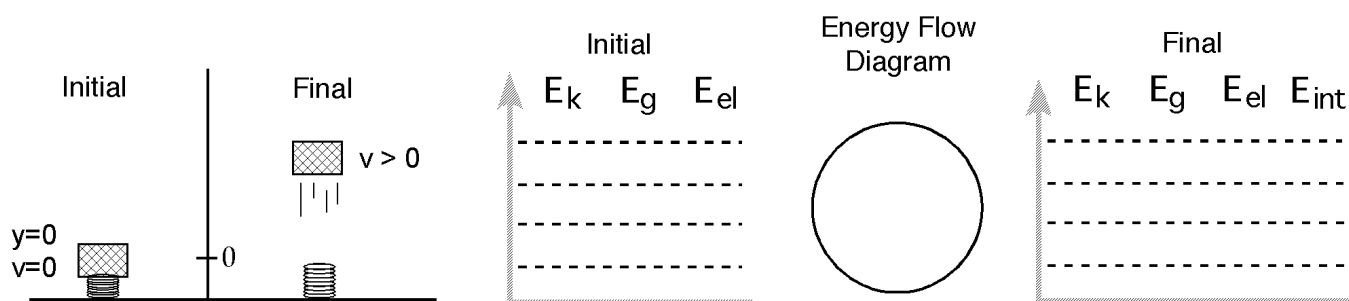
6. A crate, starting at rest, is propelled up a hill by a tightly coiled spring.

v > 0

Initial

$v_0 = 0$
$y_0 = 0$

Final

Initial
E_k E_g E_{el}

Energy Flow
Diagram

Final
E_k E_g E_{el} E_{int}
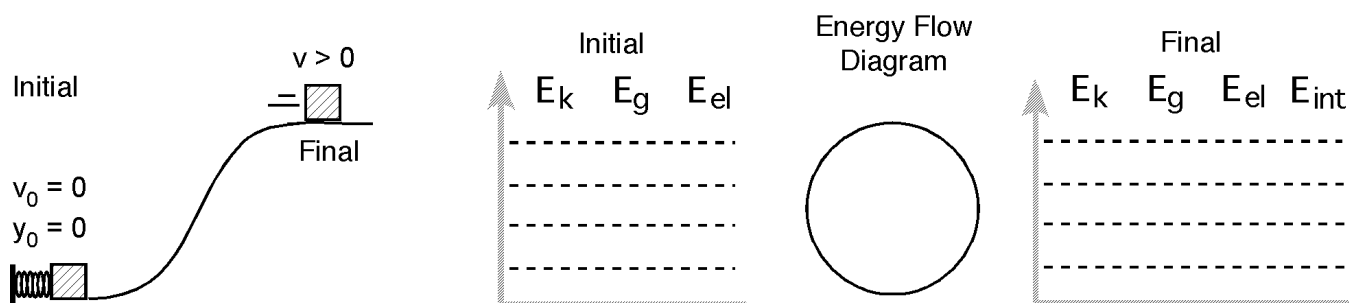
7. A bungee jumper falls off the platform and reaches the limit of stretch of the cord.

Initial   Final

v = 0

Initial

E_k E_g E_{el}

Energy Flow Diagram

Final

E_k E_g E_{el} E_{int}
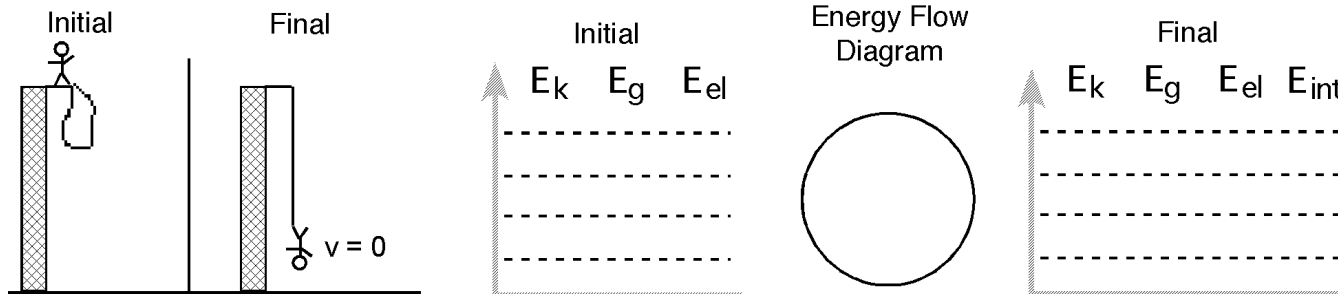
8. Superman, stopping a speeding locomotive, is pushed backwards a few meters in the process.

Initial   Final

v > 0

Initial

E_k E_g E_{el}

Energy Flow Diagram

Final

E_k E_g E_{el} E_{int}
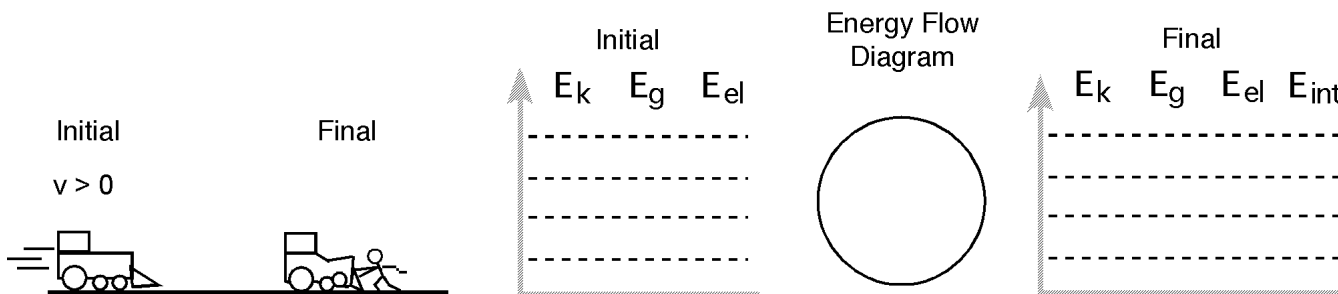
9. Create your own situation and construct corresponding energy bar graphs and system schema.

System = _____

Initial

E_k E_g E_{el}

Energy Flow Diagram

Final

E_k E_g E_{el} E_{int}