UNIT II ENERGY ADDENDUM       Particle moving with constant velocity

Lab:  motorized car moving at constant velocity

1. Ask students to discuss the energy processes and interactions that are occurring as the car moves along the table.

Discussion-Leading Questions:  (potential student responses underneath)

- How do you know energy is involved?  What is the evidence for energy?  (motion of car, making sound, changing position, warming up)
- Where does the car get the energy to move?  (battery)
- What happens to that energy?  (gets “used up” in making the car move, in making sound, in friction between tires and table)
- What is the evidence that energy is changed or “used up” or goes elsewhere?  ( battery runs down, battery is needed to make car move : won’t move on its own)

2. Represent the generalized energy processes involved in system of car + tabletop using pie charts, answering the questions Where does the energy come from?  and Where does the energy go?

\[
\text{system } = \text{ car } + \text{ surface}
\]

1. Car ’s source of energy is the battery.

2. The energy of the battery goes to making the car move (Ek) and overcoming friction (Ediss). Some has also gone to the energy of sound.

- Why are the circles the same size?  (same total energy before and after, IN THE SYSTEM)
- How would the diagram change if the car had more batteries?  (bigger circles)
- How would the diagram change if the car was trying to run in sand, or on thick carpet?  (more Ediss - less energy of motion, because car would go slower)
- Where does Ediss go? Notice it is still included in the system...  (tires, tabletop)

Transition:
At this point, if this were a pre-lab discussion, make the transition to Modeling Unit II by looking at the motion of the car instead of its energy interactions: “Now that we’ve looked at the energy involved in the motion of the car, let’s look at the motion itself. “ Or use this discussion to end Unit II, in the Post-lab discussion.