

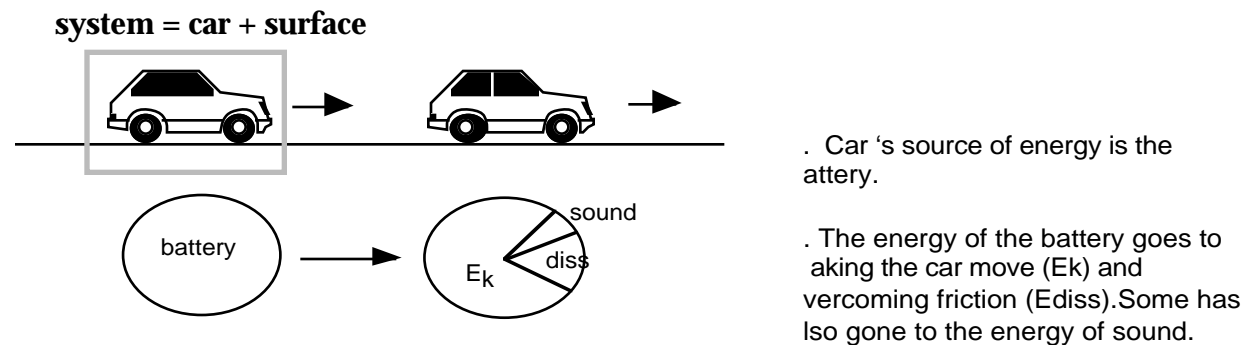
## Unit II Energy Addendum - Particle moving with constant velocity

**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?*



- 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  $E_{diss}$  - less energy of motion, because car would go slower)
- Where does  $E_{diss}$  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.