10.2 The Basic Energy Model

3. What are the two primary processes by which energy can be transferred from the environment to a system?

4. Identify the energy transformations in each of the following processes (e.g., $K \rightarrow U_g \rightarrow E_{th}$)

   a. A ball is dropped from atop a tall building.

   b. A helicopter rises from the ground at constant speed.

   c. An arrow is shot from a bow and stops in the center of its target.

   d. A pole vaulter runs, plants his pole, and vaults up over the bar.

5. The kinetic energy of a system decreases and its potential energy is unchanged. What is doing work on what? That is, does the environment do work on the system, or does the system do work on the environment? Explain.

10.3 The Law of Conservation of Energy

6. Identify an appropriate system for applying conservation of energy to each of the following:

   a. A spring is used to launch a ball into the air.

   System:

   b. A spring is used to push a car on an air track.

   System:

   c. A spring is used to slide a block across a table where it stops.

   System:

   d. A car moving on an air track collides with a spring and rebounds at essentially the same speed with which it hit the spring.

   System:

7. What is meant by an *isolated system*?

8. a. A process occurs in which a system's potential energy decreases while the environment does work on the system. Does the system's kinetic energy increase, decrease, or stay the same? Or is there not enough information to tell? Explain.

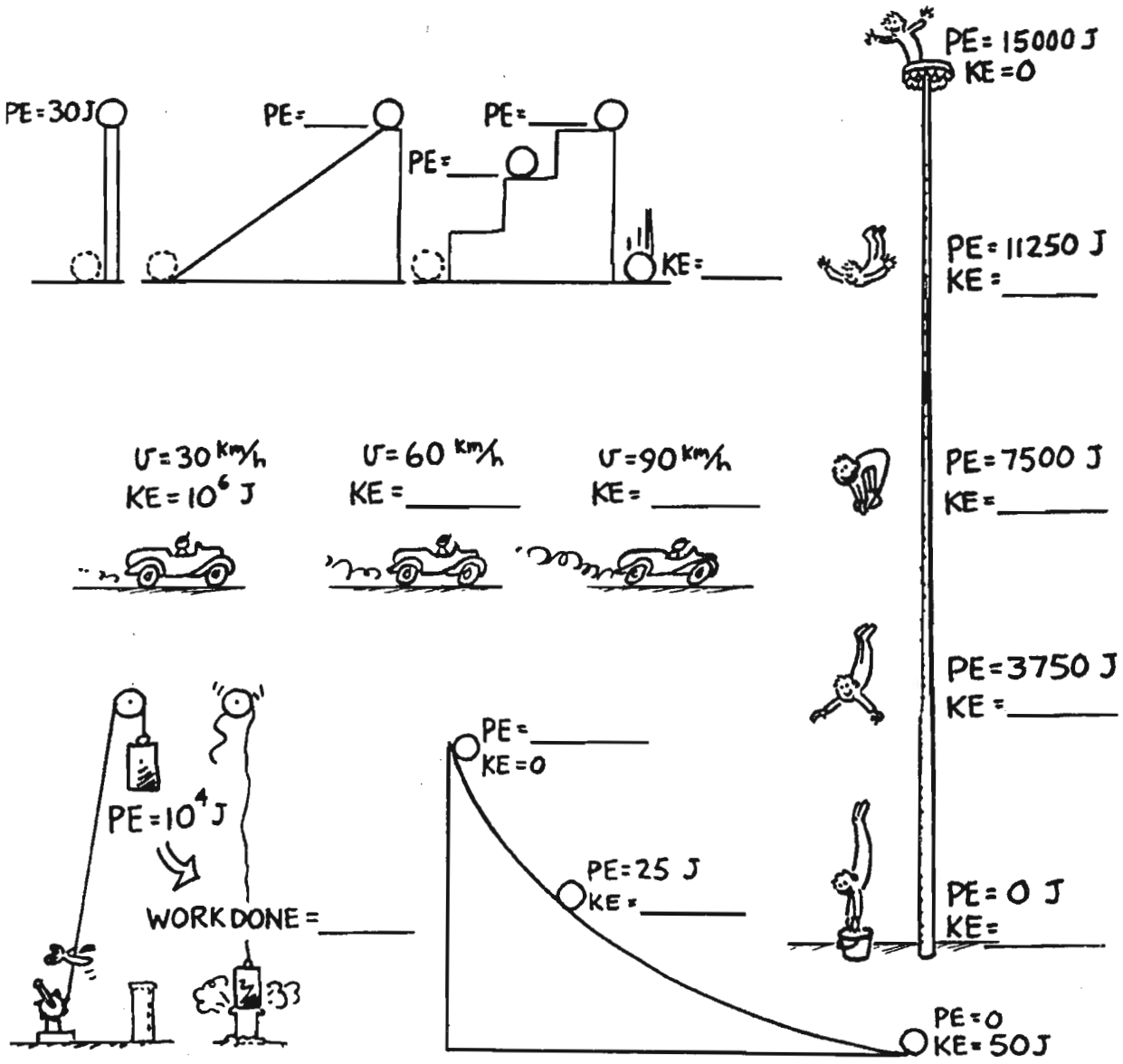
   b. A process occurs in which a system's potential energy increases while the environment does work on the system. Does the system's kinetic energy increase, decrease, or stay the same? Or is there not enough information to tell? Explain.

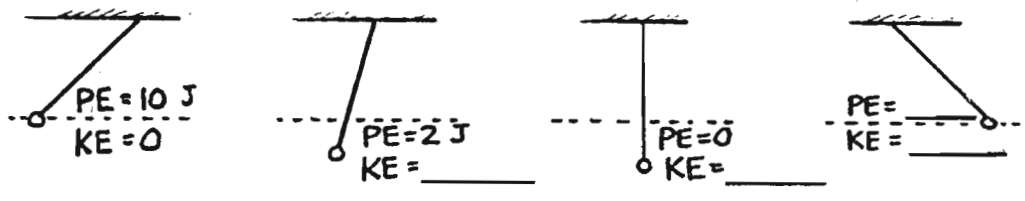
Name Period Date

Concept-Development Practice Page 8-2

Conservation of Energy

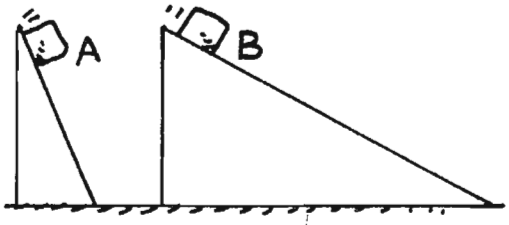
1. Fill in the blanks for the six systems shown.



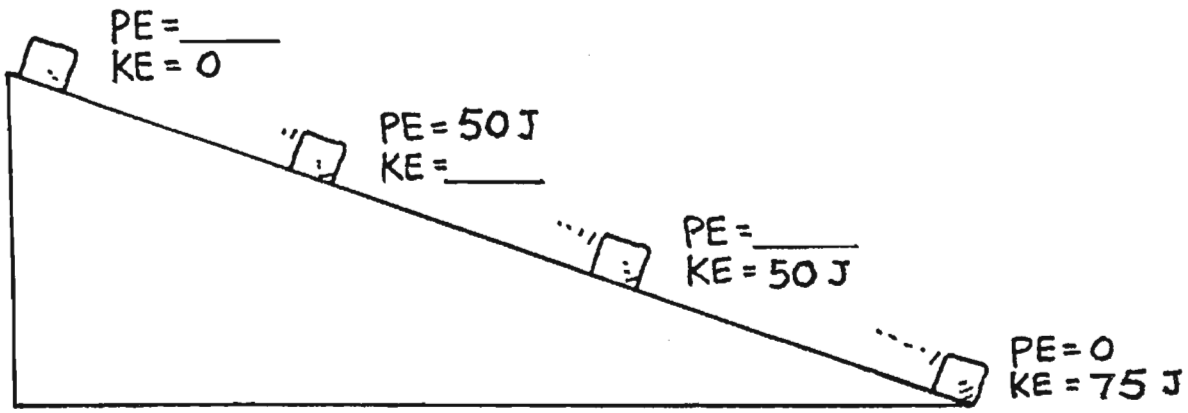


Conceptual PHYSICS

6. Which block gets to the bottom of the incline first? Assume no friction. (Be careful!) Explain your answer.



7. The KE and PE of a block freely sliding down a ramp are shown in only one place in the sketch. Fill in the missing values.



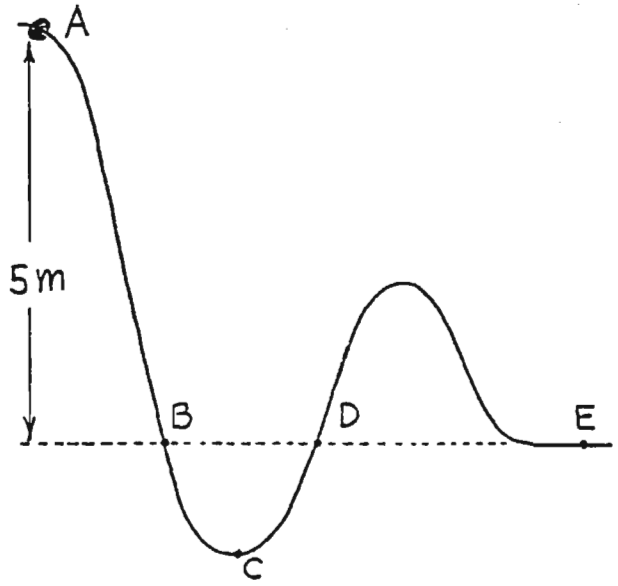
8. A big metal bead slides due to gravity along an upright friction-free wire. It starts from rest at the top of the wire as shown in the sketch. How fast is it traveling as it passes

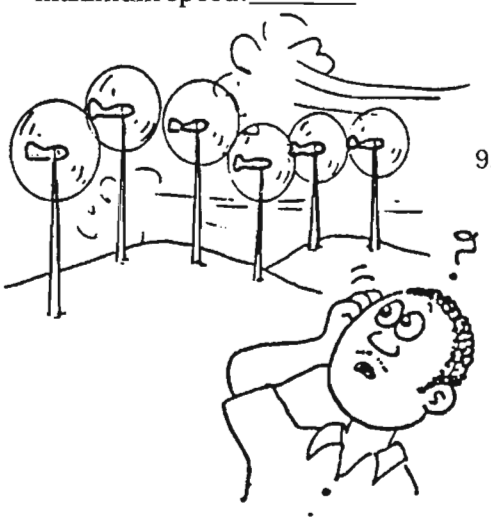
Point B?_____

Point D?_____

Point E?_____

At what point does it have the maximum speed?_____





9. Rows of wind-powered generators are used in various windy locations to generate electric power. Does the power generated affect the speed of the wind? Would locations behind the 'windmills' be windier if they weren't there? Discuss this in terms of energy conservation with your classmates.