

KINETIC AND POTENTIAL ENERGY WORKSHEET

Determine whether the the objects in the following problems have kinetic or potential energy.

Then choose the correct formula to use:

$$E_k = 1/2 m v^2 \quad \text{OR} \quad E_p = Wt. \times ht.$$

1. You serve a volleyball with a mass of 2.1 kg. The ball leaves your hand with a speed of 30 m/s. The ball has _____ energy. Calculate it.
2. A baby carriage is sitting at the top of a hill that is 21 m high. The carriage with the baby weighs 12 N. The carriage has _____ energy. Calculate it.
3. A car is traveling with a velocity of 40 m/s and has a mass of 1120 kg. The car has _____ energy. Calculate it.

Prerequisite Skills: measuring mass

Key Questions: Is mass conserved in the reaction of effervescent tablets and water?

Management or Organization Suggestions: Be wary of what kids will do with balloons.

Procedure:

1. Discuss students ideas about the meaning of conservation and come up with a definition. Tell them that they will be exploring
2. Get lab notebooks. We used the lab notebooks to write down the entire experiment.
3. Write down the question, which is the Key question above.
4. Have the students form their own hypothesis about what will happen? (This is where the students will think for themselves.)
5. Write down the materials required as given above.
6. Have the students give you the procedure; may need to provide probing/leading questions.
 - a. Pour a 100 mL of water into the bottle.
 - b. Break up the tablets and put into the balloon.
 - c. Measure the mass of the bottle and balloon, add together and record in lab book.
 - d. Dump the tablets into the bottle and have the students write down observations of the reaction for 5 minutes.
 - e. Measure the mass of the balloon and water bottle and record.
 - f. Have the students find the difference between the mass of the products and reactants.
 - g. Discuss the results. What did they find? Why is there a mass difference? Is mass conserved? Why or why not? Lead them to the fact that gas was