

Objectives for Unit #4: Energy

You should be able to do the following:

1. Explain the concept of energy. What does energy give an object the ability to do?
2. Give examples of objects that have stored energy.
3. Identify the main form of energy present in a situation. Give examples of each form.
 - a. Potential Energy: Gravitational potential energy, Chemical potential energy, Electrical potential energy, Pressure potential energy, Elastic potential energy, Nuclear potential energy
 - b. Kinetic energy
 - c. Radiant energy
 - d. Thermal energy
4. Compare energy to money. How are they similar?
5. Use the equations of energy to solve problems such as those in Section 7.1.
 - a. $KE = \frac{1}{2}mv^2$
 - b. $PE = mgh$
6. If two objects are moving at the same speed, but one is heavier than the other, which will have more kinetic energy?
7. If two objects have the same mass but one is moving faster than the other, which will have more kinetic energy?
8. If two objects have the same mass but one is higher off the ground than the other, which will have more potential energy?
9. If two objects are the same height off the ground but one is heavier than the other, which will have more potential energy?
10. What happens to the amounts of kinetic energy and potential energy as a ball is tossed from your hand into the air?
11. Give examples of various energy transformations. For example, give an example of
 - a. Chemical energy being transformed into electrical energy
 - b. Elastic energy being transformed into kinetic energy
 - c. Kinetic energy being transformed into pressure energy
 - d. Radiant energy being transformed into chemical energy
 - e. Gravitational potential energy being transformed into kinetic energy
 - f. Kinetic energy being transformed into potential energy.
 - g. Radiant energy is being transformed into thermal energy.
 - h. Think of other possible transformations
12. Be able to make a sequence of 4 or more different energy transformations in a row.
13. Using a roller coaster, explain the relationship between gravitational potential energy, kinetic energy, friction and thermal energy.
14. Explain why the second hill of a roller must always be lower than the hill before it in order for the car to make it to the top.
15. Tell the unit of energy we mainly use in Physics and give it's equivalent representation using seconds, kilograms and meters.
16. Using a hoop spring (like we used) predict what happens to the velocity of a car as the hoop is compressed more and more and then released to push the car. What would the graph look like?
17. Using a car to push a box, predict what will happen to the distance the box moves as the velocity of the car increases. What will the graph look like? What will happen to the distance the box moves if the mass of the car is increased? What would the graph look like?
18. Design an experiment using beads and thermometers to develop a relationship between the amount of friction and thermal energy.
19. Given data for an object with a specific mass dropped from various heights and the resulting velocities, calculate the initial potential energy and the final kinetic energy. Why should these values be the same?
20. Given data for an object with a specific mass pushed at various velocities up a sloped ramp and the resulting change in height of the object, calculate the initial kinetic energy and the final potential energy. Why should these values be the same?

Your textbook has many useful practice problems at the end of each chapter. Use this table to practice for your test for chapter 7 (pages 184 – 186). I have selected the questions appropriate for your test.

Section	Chapter 7
Vocabulary	#1-6, 8
Concepts	#1-4, 6-12
Problems	#1-5, 7-8
Applying your Knowledge	#4, 5

Don't forget to try and review the section reviews (7.1 #1-9, 7.2 #1 & 3, and 7.3 #1, 2, 3, 5, 7) for the pages we have read. Look at your binder pages for practice, too. (Some of these have been assigned, so try again to check yourself.)