

Our goals in our study of Conservation of Energy (which includes Chapter 10 – Energy and Work and the associated lecture, lab, problem session, and problem set) are to be able to:

1. Name and describe different “forms” of energy and energy transformations.
2. Describe and use the work-energy equation. Explain how for an isolated system, the work-energy equation becomes the law of conservation of energy.
3. For a given force on object, the displacement of that object, and the angle between the force and displacement, calculate the work done on the object by that force.
4. Relate an object’s mass, speed, and kinetic energy, and given any two of an object’s mass, speed, and kinetic energy, calculate the third. Similarly, relate an object’s moment of inertia, angular speed, and rotational kinetic energy, and given any two, calculate the third.
5. Describe the types of forces with which a potential energy may be associated, and use the formulas for gravity potential energy and spring potential energy.
6. State and recognize the conditions under which conservation of mechanical energy applies. Solve problems using this principle. For problems where mechanical energy is not conserved, relate the change in mechanical energy to the work done by non-conservative forces.

Reading Assignment

Ch. 10: Work and Energy. Skip p. 311 – 312 and section 10.8 Power

Problem Set

Ch. 10 Student Workbook: 4, 5, 27a, 7, 9, 11, 12, 13, 14, 20, 21, 22, 23

Ch. 10 Conceptual/Multiple Choice: 25, 26, 27

Ch. 10 Problems: 3, 27, 28, 29, 31, 32, 36, 51, 52, 55, 63, 64

Notes:

- We will not have class on Monday January 21. There is still a Reading Response due for this material.
- Please bring your PhysiKit with you to lecture/lab on Tue. Jan. 22 or Wed. Jan. 23. We will use several items, including the bouncing balls and the various “poppers”.
- Please bring your Student Workbook with you to lecture/lab on Tue. Jan. 22 or Wed. Jan. 23. We will rely on it heavily.
- The quiz will be administered at the beginning of lecture/lab on Tue. Jan. 22 or Wed. Jan. 23.

Before our physics lecture on Monday January 28 (week 4), please view the following film (app. 30 minutes long) and answer the following questions.

Frames of Reference, original ©1960 Educational Services Incorporated, now freely available at http://www.archive.org/details/frames_of_reference

- 1) What did you see that reinforced something about the physical world you might already be familiar with from your everyday experience and/or learned knowledge?
- 2) What did you see that surprised you about the physical world?
- 3) What did you see that connected with work we’ve previously done (or that you’ve done in a previous class)?
- 4) What parts of the film did you find less interesting, and why?
- 5) What parts of the film did you find most interesting, and why?
- 6) Were you struck by any ‘theatrical’ moments in the film?
- 7) What did you see that you now have questions about that you might not have had before (or that you had before but continue to have)?