

NORTHERN ILLINOIS UNIVERSITY

PHYSICS DEPARTMENT

Physics 162 – Astronomy

Fall 2024

Problem Set #2

Problem Set Due: Thurs., Sept. 12, 2024

Read OpenStax: Chapter 2

Show explicitly all your work for full credit.

- | | |
|-------------------------------|-----------------------------|
| 1. Expert TA: 2.1.2 | multiple choice |
| 2. Expert TA: 2.1.33 | multiple choice |
| 3. Expert TA: 2.1.57 | multiple choice |
| 4. Expert TA: 2.2.1 | show calculation |
| 5. Expert TA: 2.2.2 | show calculation |
| 6. Expert TA: 2.3.2 | draw figure |
| 7. Expert TA: ch_2.2.review | explain |
| 8. Expert TA: ch_2.23.thought | explain |
| 9. Expert TA: 2.6.1 | true/false |
| 10. Expert TA: 2.6.29 | true/false |
| 11. Expert TA: 2.7.3 | simulations—multiple choice |
12. OpenStax: Go to **Page 26** in **Chapter 1** and do the “Link to Learning” exercise on constructing an atom.

All life on earth are carbon-based life forms. We therefore must consume carbon in order to grow and thrive on Earth.

- (a) Construct a carbon atom using the Phet interactive simulation “Build an Atom”. Use the *snipping tool* in Windows or the Mac to take a picture—save it and copy it to your Word document homework writeup.

For Windows: click on the “Start” button and type “Snipping Tool”

For the Mac: press the Shift+Command+5 keys at the same time

- (b) For a stable, neutral atom, how many protons, neutrons, and electrons can the carbon have?
- (c) When does the atom become an ion?
- (d) When does the atom become unstable?