

Honors Freshman Physics

Chapter 2: Linear Motion - A study of the motion of objects.

Test date: September 5, 2008

The goal of this unit will allow each student to:

- a. gain a better understanding of the concepts of speed, velocity and acceleration as well as describing them visually through the use of graphs and as they apply to freefall
- b. continue making proper scientific measurements and calculations w/ significant digits
- c. define and properly use all vocabulary
- d. properly apply all terms in describing/explaining real world examples
- e. relate these concepts her/his daily activities and behaviors
- f. teach someone else the concepts discussed
- g. practice proper laboratory safety & use of lab equipment and computers

Performance Objectives: After completing this unit, when asked in class or on a written test or quiz, each student will:

1. **Distinguish** between precision & accuracy in measurements.
2. **Use** significant digits when making & recording direct measurements based on the precision of the measurement tool.
3. **Report** all direct measurements with the exact/certain digits and ONE estimated/guessing number and the unit.
4. **Identify** the number of significant digits in a given measurement
5. **Use** rounding rules for final answers to mathematical calculations (KUES problems)
6. **Write** measurements in scientific notation
7. **Describe** a moving object with respect to a frame of reference
8. **Define** the terms: position, distance, displacement, speed, velocity, acceleration
9. **Distinguish** between distance and displacement
10. **Identify** vector and scalar quantities
11. **Distinguish** between *change in*, *average*, and *constant*: speed, velocity, acceleration
12. **Describe** the motions of an object with constant velocity and one undergoing acceleration
13. **Recognize** a speed, velocity, and acceleration by the units only
14. **Interpret** (a) position v. time (b) speed v. time and (c) velocity v. time line graphs
15. **Construct** (a) position v. time (b) speed v. time and (c) velocity v. time graphs from given data
16. **Collect** necessary data from a given scenario to construct a position v. time graph
17. **Perform** mathematical calculations using (KUES) to determine (a) speed, time, or distance (b) velocity, displacement, or time and (c) acceleration, change in velocity, or time
18. **Use** a position vs time graph to calculate velocity from the slope
19. **Use** a velocity vs time graph to calculate acceleration and distance traveled
20. **Describe** the motion of an object in freefall
21. **Calculate** the speed and distance for an object in freefall

Textbook- Physics A First Course

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Textbook References

Physics: A First Course - issued textbook	Section Reviews Suggested Independent Practice
2.2– Acceleration - p. 32-34 only	2.2 p. 38 #1
2.3– Gravity & Freefall - p. 39-42	2.3 p. 45 #1-3
2.4 – Graphs of Motion - p. 46-51	2.4 p. 51 #1-4

Textbook Homework - *UV-Understanding Vocabulary RC-Reviewing Concepts SP- Solving Problems*

Date	Section	Assignment	Completed
	2.2 – p. 54 & 55	RC: 6,7,8,10 SP: 3, 4(a,b) 5, 6d	
	2.3 – p. 54 & 55	RC: 13,14,15,16,17 SP: 8 (a-d)	
	2.4 – p. 55 & 56	RC: 21,22,23,24,25, 26 SP: 11,13,15,16, 17, 18	

Lingo To Be Learned- definitions are provided on-line

accuracy, precision, x-axis, y-axis, slope, speed (average, constant, instantaneous), velocity (average, constant), acceleration (average, constant), distance, time, direction, position, displacement, scalar, vector, freefall, magnitude, frame of reference

Worksheets - Linear Motion Practice

Group Lab - ...the Need for Speed!

Explorations - TBA

Suggested Science, Technology, and Society (STS) Enrichment Topics

Here is a list of some applications of the material in this Unit. If you are interested in furthering your knowledge in this Unit's content, articles in these area may help.

<ul style="list-style-type: none"> -Effects of acceleration on the human body -Timing Olympic athletes -How do police determine if you are speeding? 	<ul style="list-style-type: none"> -The history of the Land Speed record -The roller coaster -The sound barrier -Mars Mission measurement fiasco 	<ul style="list-style-type: none"> -Einstein's "Twin Paradox" -Auto/drag racing -Why do we like to go fast? -History of measurement systems
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