

Unit 10 – Vocabulary and Equations – Freefall

<p><u>Vocabulary:</u> previous vocabulary $g = -9.8 \text{ m/s}^2$ (memorize this value!) freefall, terminal velocity, air resistance, drag hang time, up down, down time, reaction time anticipation, reaction</p>	<p><u>Equations & constants:</u> You get these on test: $v = \frac{\Delta x}{\Delta t} \qquad a = \frac{\Delta v}{\Delta t}$ $\Delta x = v_0 \Delta t + \frac{1}{2} a t^2$ $v_f = v_0 + a \Delta t \qquad v_f^2 = v_i^2 + 2a \Delta x$ 60 mph = 27 m/s; 1609 m = 1 mi</p>
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Unit Objectives – Williams

1. I understand all the vocabulary & math of this unit and all demos, videos, equations, and class assignments.
2. I remember objectives & vocabulary from previous units.
3. I have memorized g , the acceleration of gravity on earth's surface including the units
4. I understand what freefall is and can contrast it with terminal velocity
5. I know hang time and that it includes time for both the upward and downward motions of airborne object
6. I understand what g is and realize that g is a constant negative value, it does NOT become zero at the high point or switch signs on the way down
7. I understand motion graphs related to freefall, terminal velocity, reaction time and other topics in this unit
8. I can look at physics problems and know what assumptions to use to solve them including when $v = 0$ and the concept of symmetry
9. I know when to double the time (hang time) and when not to (reaction time)
10. I remember the objectives from the previous unit since they still apply to this unit!
11. I can apply one-dimensional motion equations and TNEOM to solve freefall and hangtime problems

DuPage ROE Objectives

101. I can distinguish between scalar and vector quantities.
102. I can differentiate between accelerated and constant velocity motion.
103. I can describe and analyze motion based on graphs, numeric data, words, and diagrams.
104. I can differentiate between speeding up, slowing down, and change in direction, based on the direction of velocity and acceleration.
107. I can justify that if the only force acting on an object is gravity, it will have the same constant downward acceleration regardless of mass, velocity or position.

10Free Fallin' Calendar: 2016-17 (Williams)

Bold and underlined means put in journal notes.

1-LS	<u>Mo: 01/23/17</u>	<ul style="list-style-type: none"> • Notes <u>(10-01)</u> FreeFallin (ONLY notes this unit) • Quick drill pk problems, HW time 	• H10-01
2	<u>Tu: 01/24/17</u>	<ul style="list-style-type: none"> • Tracker: Dr. V drops coffee filters...estimate TV and find FF region 	• H10-02
3	<u>We: 01/25/17</u>	<ul style="list-style-type: none"> • Tracker: Find g yourself (drop a ball)...group emails marked up V and a graphs estimating g • Time permitting: Quick drills, HW time 	• H10-03
4	<u>Th: 01/26/17</u>	<ul style="list-style-type: none"> • Pairs quiz, Moodle/HW time 	• H10-04
5	<u>Fr: 01/27/17</u>	<ul style="list-style-type: none"> • Hang time lab, timed quiz or do for HW (class choice) 	• (← Depends)
6-LS	<u>Mo: 01/30/17</u>	<ul style="list-style-type: none"> • Reaction time lab 	• H10-05
7	<u>Tu: 01/31/17</u>	<ul style="list-style-type: none"> • Pairs quiz, Moodle/HW time 	• H10-06
8	<u>We: 02/01/17</u>	<ul style="list-style-type: none"> • 	• Study for test
9	<u>Th: 02/02/17</u>	<ul style="list-style-type: none"> • Free Fallin' Test 	•