

Universal Gravitation

Name: _____ Date: _____



Purpose: This is an independent study aimed at aiding you, the student, with learning how to study a particular topic, independently. This study will help prepare you for your university or college career.

Introduction: Everyone knows that gravity makes things fall (accelerate) towards the surface of the Earth, but how can this force be quantified? Is there an equation that describes the force of attraction between two objects? How does mass and distance affect the force of gravity? How do gravity, circular motion and projectile motion explain why the moon orbits the Earth and why satellites orbit the Earth?

Your Task: Read the required sections. Make notes about the important points (i.e. summarize the information that you've read. Include diagrams where necessary and highlight key equations (state what each of the variables represents and include appropriate units).

Questions are referenced from the *Nelson Physics 12 © 2003* textbook plus you may use any online resources as long as they are referenced.

Universal Gravitation Questions

- Read pages 139-140: Newton's Law of Gravitation - **Take clear and detailed notes and write out any equations – box them.**
Practice - **p. 141 # 3, 4, 5** [follow the sample problem]
- Read page 142: Determining the Universal Gravitation Constant - **make short notes about the determination and the significance of the experiment. Include relevant diagrams (referenced).**
Understanding Concepts - **p. 143 # 8,9, 10, 11**
[hint for #10 - <http://www.physicsclassroom.com/class/circles/u6l3e.cfm>]
Understanding Concepts – **p. 144 # 5** [use vector addition for part b]

Satellites and Space Stations

- Read pages 145-146: **Take clear and detailed notes and write out any equations – box them.**
Questions: **p. 147 # 2, 3**
- Read pages 148-149: Apparent Weight and Artificial Gravity - **Take notes.**
Questions: **p. 150 # 8, 10**