Course Content by Unit

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| **Grade Level: 9-12** | | | | | | | |
| **Subject: Physics** | | | | | | | |
| **Unit: Newton’s Law of Motion** | | | | | | | |
| **Time Allotment: 3 weeks** | | | | | | | |
| **Instructional Objectives** | **Content** | | | | **Biblical Integration** | |
| At the end of this unit students will be able to:   1. Identify the effect of inertia on both moving and stationary objects 2. Describe the relationship between force, mass, and acceleration when a force is applied to an object 3. Distinguish between static and kinetic friction and determine their effects on the motion of objects 4. Create free body diagrams of the interactions between objects and forces 5. Identify the effect of air resistance on falling objects | In this unit I will teach lessons on:   1. Forces – net force, gravitational force, normal force, frictional force, tension 2. Newton’s 1st Law of Motion – inertia 3. Newton’s 2nd Law of Motion – 4. Free body diagrams 5. Air resistance and terminal velocity 6. Newton’s 3rd Law of Motion – every action has an equal and opposite reaction | | | | 1. Students will learn and discover the order and predictability of how things move in our everyday lives and how it points to a creator.   Romans 1:20 | |  | |
| **Activities and Methods** | | **Evaluation/Assessment** | | **Texts and References** | |
| I will use these methods to teach this unit:   1. Lecture 2. Powerpoint 3. Note taking 4. Discussion 5. Modeling 6. Demonstration   Activities/Projects   1. Pulleys Lab – Calculate the horizontal acceleration of a cart being pulled by a falling weight | | I will know my objective has been met because I will assign and assess:   1. Homework Assignment 2. Course Text Outlines 3. Labs 4. Quizzes 5. Chapter Tests 6. Notebook checks 7. Projects | | Textbook: Conceptual Physics, Paul G. Hewitt, 2002, Chapters 4-6  Additional texts: Physics, Serway & Vaughn, 2002, Ch 4  Physics, Giancoli 6th ed, 2005, Ch 4 | |
| **CA Content Standards** | | | **ESLR** | | | |
| HS-PS2-1. Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. | | | **Scholars**  Students will demonstrate that they are scholars by applying the knowledge and skills that they learn in class in order to approach and solve problems based on real life situations, thus preparing them to be key assets in their future careers. | | | |  | |