

TRINITY CHRISTIAN SCHOOL

Curriculum Guide

Course Title: Physics

Grade Taught: 12th Grade

Credits: 1 Credit

A. Course goals:

1. To know formulas for static physics and motion oriented physics.
2. To be able to use formulas to solve word problems.
3. To develop an understanding of motion in the world around us through a mathematical perspective.

B. Course topics:

<u>Topic:</u>	<u>Instructional materials</u>	<u>Measurement</u>	<u>Time</u>
1. Metric system, measuring units, accuracy and precision	TN, T	CT	2-3
2. Scientific notation and significant digits	TN, T	CT	2-3
3. Distance, displacement, speed, and velocity	TN, T	CT, F	3-4
4. Acceleration, acceleration and velocity graphs	TN, T	CT, F	3-4
5. One dimensional motion using velocity, acceleration, and time	TN, T	CT, F	3-4
6. Free fall and gravity	TN, T	CT	4-5
7. Equations relating velocity, time, distance, and acceleration	TN, T	CT, F	3-4
8. Vectors	TN, T	CT, F	3-4
9. Adding and subtracting vectors	TN, T	CT, F	4-5
10. Using vectors in real applications	TN, T	CT, F	3-4
11. Parabolic motion (splitting 2D problems into 2 problems) Using tables for x and y dimension	TN, T	CT, F, P	4-5
12. Range equation	TN, T	CT, F	2-3
13. Newton's 1 st law	TN, T	CT	2-3
14. Newton's 2 nd law	TN, T	CT	2-3
15. Newton's 3 rd law	TN, T	CT	2-3
16. Friction	TN, T	CT, F	2-3
17. Rotational motion and torque	TN, T	CT, F	3-4
18. Equilibrium in rotational motion	TN, T	CT, F	3-4
19. Forces on an incline	TN, T	CT	2-3
20. Centripetal force	TN, T	CT, F	4-5

21. Gravity, gravity as a centripetal force	TN, T	CT, F	4-5
22. Work and energy	TN, T	CT, F	2-3
23. Kinetic and potential energy	TN, T	CT, F, P	3-4
24. Momentum	TN, T	CT	5-6
25. Periodic motion and pendulums	TN, T	CT, F	4-5
26. Springs and mass-spring systems	TN, T	CT, F, P	4-5
27. Waves	TN, T	CT, F	3-4
28. The Doppler effect	TN, T	CT, F	3-4
29. Light as a wave and a particle	TN, T	E	3-4
30. Reflection in flat, convex, and concave mirrors	TN, T	CT, F	4-5
31. Converging and diverging lenses	TN, T	CT, F	4-5
32. Electric charges and fundamental electricity	TN, T	CT, F	3-4
33. Electrostatic forces and electric fields	TN, T	CT, F	3-4
34. Electric potential, potential energy, and potential difference	TN, T	CT, F	4-5
35. Capacitors and electrical storage	TN, T	CT	4-5
36. Voltage, current, and resistance	TN, T	CT, F	5-6
37. Series and parallel electrical circuits	TN, T	CT, F, P	4-5
38. Magnets and magnetic fields	TN, T	CT	3-4
39. Electromagnetism	TN, T	CT	4-5

C. Student Materials

1. (T) *Exploring Creation with Physics: Second addition*, Apologia Educational Ministries, 2004

D. Teacher Materials

1. *Exploring Creation with Physics: Second addition*, Apologia Educational Ministries, 2004
2. (TN) Accumulated Teacher Notebook

E. Classical Methodology

1. Students should apply mathematical formulas to real situations encouraging a depth of thinking within the limits of science and mathematics.
2. Students should develop a further desire to understand the physical world from a scientific perspective.

Measurement Key:

CT= Chapter test, F= Final, E= Essay, L= Lab, P= Project