Pacing Guide for 7-12 Curriculum

Course Title: _____Physics_____ Length of Course: ___36 Weeks_____

Week Number	Chapter & Lesson	COS	Objectives	Strategies/ Materials Needed
Week 1	Orientation Lab Safety Lab Equipment Chapter 1: The Science of Physics	AHSGE 1	*SWBAT* 1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment. • Select appropriate glassware for conducting experiments including a graduated cylinder, a beaker, a flask, a test tube, a microscope slide, a pipette, and a Petri dish • Select appropriate measuring equipment for conducting experiments including a balance and a stopwatch.	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO – show lab equipment
Week 2	Chapter 1: The Science of Physics	AHSGE 1	1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment. • Select appropriate glassware for conducting experiments including a graduated cylinder, a beaker, a flask, a test tube, a microscope slide, a pipette, and a Petri dish • Select appropriate measuring equipment for conducting experiments including a balance and a stopwatch.	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO – show lab equipment
Week 3	Chapter 2: Motion in One Dimension	COS1 COS4	1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object 4.Describe quantitative relationships for velocity, acceleration	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Displacement p. 42
Week 4	Chapter 2: Motion in One Dimension	COS1 COS4	1. Explain linear, uniform circular, and projectile motions using one- and two dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object 4. Describe quantitative relationships for velocity, acceleration	Textbook, Handouts, Presentation notes, AV aids, etc. Demo- Const. Acceleration p.51

Week 5	Chapter 3: Two Dimensional Motion and Vectors	COS 1 COS 4	1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object 4. Describe quantitative relationships for velocity, acceleration	Textbook, Handouts, Presentation notes, AV aids, etc. LAB- Quick lab Projectile motion p. 97
Week 6	Chapter 3: Two Dimensional Motion and Vectors	COS 1 COS 4	1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object 4.Describe quantitative relationships for velocity, acceleration	Textbook, Handouts, Presentation notes, AV aids, etc. LAB- 2D motion
Week 7	Chapter 4: Forces and the Laws of Motion	COS 1 COS 4	1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object 4.Describe quantitative relationships for velocity, acceleration	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO 2nd Law of motion
Week 8	Chapter 5: Work and Energy	COS 1 COS 4	1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object 4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO – Work and Quantifying work pp.160&162
Week 9	Chapter 5: Work and Energy	COS 1 COS 4	1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object 4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	Textbook, Handouts, Presentation notes, AV aids, etc.
Week 10	Chapter 6: Momentum and Collisions	COS 2	2. Define the law of conservation of momentum. • Calculating the momentum of a single object • Calculating momenta of two objects before and after collision in one-dimensional motion	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Collision Types

Week 11	Chapter 6: Momentum and Collisions	COS 2	2. Define the law of conservation of momentum. • Calculating the momentum of a single object • Calculating momenta of two objects before and after collision in one-dimensional motion	Textbook, Handouts, Presentation notes, AV aids, etc.
Week 12	Chapter 7: Circular Motion and Gravitation	COS 1,3,4	Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance- time or velocity-time data • Describing forces that act on an object . Explain planetary motion and navigation in space in terms of Kepler's and Newton's laws. 4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	Textbook, Handouts, esentation notes, AV aids, etc. EMO- Centripetal Force
Week 13	Chapter 7: Circular Motion and Gravitation	COS 1,3,4	Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance- time or velocity-time data • Describing forces that act on an object . Explain planetary motion and navigation in space in terms of Kepler's and Newton's laws. 4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	Textbook, Handouts, esentation notes, AV aids, etc.
Week 14	Chapter 8: Fluid Mechanics	COS 1,4	Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance- time or velocity-time data • Describing forces that act on an object 4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	Textbook, Handouts, esentation notes, AV aids, etc.
Week 15	Chapter 9: Heat	COS 5	5. Explain the concept of entropy as it relates to heating and cooling, using the laws of thermodynamics. • Using qualitative and quantitative methods to show the relationship between changes in heat energy and changes in temperature	Textbook, Handouts, Presentation notes, AV aids, etc. LAB- Blank Thermometer
Week 16	Chapter 9: Heat	COS 5	5. Explain the concept of entropy as it relates to heating and cooling, using the laws of thermodynamics. • Using qualitative and quantitative methods to show the relationship between changes in heat energy and changes in temperature	Textbook, Handouts, Presentation notes, AV aids, etc. LAB- Specific Heat

Week 17	Chapter 10: Thermodynamics	COS 5	5. Explain the concept of entropy as it relates to heating and cooling, using the laws of thermodynamics. • Using qualitative and quantitative methods to show the relationship between changes in heat energy and changes in temperature	Textbook, Handouts, Presentation notes, AV aids, etc.
Week 18	Mid-term review and test		Above objectives	Textbook, Handouts, Presentation notes, AV aids, etc.
Week 19	Chapter 11: Vibrations and Waves	COS 6 and 7	6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media 7. Describe properties of reflection, refraction, and diffraction. • Demonstrating the path of light through mirrors, lenses, and prisms • Describing the effect of filters and polarization on the transmission of light	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Wave Types Transverse and Longitudinal
Week 20	Chapter 11: Vibrations and Waves Chapter 12: Sound	COS 6 and 7	6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media 7. Describe properties of reflection, refraction, and diffraction.	Textbook, Handouts, Presentation notes, AV aids, etc.

Week 21	Chapter 12: Sound	COS 6 and 7	6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media 7. Describe properties of reflection, refraction, and diffraction.	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Doppler Effect
Week 22	Chapter 13: Light and Reflection	COS 6 and 7	6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media 7. Describe properties of reflection, refraction, and diffraction. • Demonstrating the path of light through mirrors, lenses, and prisms • Describing the effect of filters and polarization on the transmission of light	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Convex and Concave Mirrors

Week 23	Chapter 13: Light and Reflection Chapter 14: Refraction	COS 6 and 7	6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Describing the change of wave speed in different media 7. Describe properties of reflection, refraction, and diffraction. • Demonstrating the path of light through mirrors, lenses, and prisms • Describing the effect of filters and polarization on the transmission of light	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Convex and Concave lenses
Week 24	Chapter 14: Refraction	COS 6 and 7	6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media 7. Describe properties of reflection, refraction, and diffraction. • Demonstrating the path of light through mirrors, lenses, and prisms • Describing the effect of filters and polarization on the transmission of light	Textbook, Handouts, Presentation notes, AV aids, etc.

Week 25	Chapter 15: Interference and Diffractions	COS 6 and 7	6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media 7. Describe properties of reflection, refraction, and diffraction. • Demonstrating the path of light through mirrors, lenses, and prisms • Describing the effect of filters and polarization on the transmission of light	Textbook, Handouts, Presentation notes, AV aids, etc.\ DEMO- Diffraction grating
Week 26	Chapter 16: Electrical Forces and Fields	COS 8 and 9	8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law 9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Van de Graff Generator
Week 27	Chapter 16: Electrical Forces and Fields Chapter 17: Electrical Energy and Current	COS 8 and 9	8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law 9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Dynamo induction generator
Week 28	Chapter 17: Electrical Energy and Current	COS 8 and 9	8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law 9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	Textbook, Handouts, Presentation notes, AV aids, etc.

Week 29	Chapter 18: Circuit and Circuit Elements	COS 8 and 9	8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law 9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Ohms Law
Week 30	Chapter 18: Circuit and Circuit Elemtents Chapter 19: Magnetism	COS 8 and 9	8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law 9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Magnetic Poles
Week 31	Chapter 19: Magnetism	COS 8 and 9	8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law 9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	Textbook, Handouts, Presentation notes, AV aids, etc.
Week 32	Chapter 20: Electromagnetic Induction	COS 8 and 9	8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law 9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	Textbook, Handouts, Presentation notes, AV aids, etc. DEMO- Orsteads EM relationship

Week 33	Chapter 20: Electromagnetic Induction	COS 8 and 9	8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law 9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	Textbook, Handouts, Presentation notes, AV aids, etc.
Week 34	Chapter 21: Atomic Physics	N/A		
Week 35	Chpater 22: Subatomic Physics	N/A		
Week 36	Final Exam Review and Exam			