OLEAN HIGH SCHOOL

2013-14

Course Name: Physical Setting: Physics

Text : Physics Principles and Problems

Unit & Approx. Time	Skills	Lab Activities	Major Assessments	Physics Learning Standards	Common Core Standards	Resource/Text Page
Measurement **Thru mid Sept.**	• Making accurate measurements • measurement uncertainties • Converting measurements • Estimating with the metric system • graphing data	• Paper tower • Circumference vs. Diameter	• SLO pre-test • Chapter 2 Test -- mathematics	1.M1.1 1.M2.1 1.M3.1 1.S2.1 1.S3.1 1.S3.4 1.T1.1 6.M2.2 6.M2.4 6.MS3.2 6.O	RST 11-12 .1 WS 11-12.2 **ELA** WS 11-12.7 MP 1,2,4,5,6 HSN-Q 1-3 HAS-REI 10 **Math** HSF-IF 6 HSS-ID 6,7	Text Chapter 2 Toward a Metric America Metric Mishap caused loss of NASA orbiter Castle learning Physics classroom
Motion and vectors **Thru end of Sept.**	• Picturing motion • Describing motion • Working with vectors • Understanding distance/displacement, speed/velocity and acceleration • Solving problems using equations	• Ticker tape • Kids kinematics • Graphical addition of vectors • Paper river	• Test chapters 3 and 4	1.M1.1 1.M1.2 1.M3.1 1.S2.1 1.S2.2 1.S3.1 1.S3.3 1.S3.4 2.IS1.3 5.1i,iv,vi	RST 11-12.7 WS 11-12.2 **ELA** WS 11-12.9 MP 1,2,3,4,5,6 HSN-Q 1-3 HV-NM 1-4 **Math** HA-CED 1 HAS-REI 10 HSF-IF 4,6,7 HF-LE 1 HG-SRT 5,8 HSS-ID 6,7	Text chapters 3 and 4 Frames of reference video GPS web search Castle learning Physics classroom

Unit and Approximate time	Skills	Lab Activities	Major Assessments	Physics Learning Standards	Common Core Learning Stds.	Resource/Text Page
Mathematical model of motion **Thru mid Oct.**	• Graphing motion Including displacement, velocity and acceleration • Understanding constant velocity • Understanding constant acceleration • Free fall motion	• Graph matching • Picket fence • Reaction time of a physics student	• Test ch 5	1.M 1.1 1.M 2.1 1.M 3.1 1.S 3.1 1.S 3.3 5.1 i ,ii, iii	RST 11-12 .1 **ELA** WS 11-12.7 MP 1,2,4,5,6 HSN-Q 1-3 HAS-REI 10 **Math** HSF-IF 4,6,7 HF-LE 1 HSS-ID 6,7,8	Text chapter 5 Felix free –fall article and video Motion scenario worksheet Castle learning Physics classroom
Forces **Thru end of Oct.**	• Forces • Newton's Laws • Interaction forces • Forces in 2D involving equilibrium, resultant forces, and equilibrant forces • Diagramming forces with free-body diagrams • Friction	• Elevator ride • Coefficient of friction project	• Test ch 6	1.M 1.1 1.S2.1-4 1.S3.1,3,4 2.IS1.1,3 5.1 v, viii ,ix ,x,	WS 11-12.2 WS 11-12.7 WS 11-12.8 **ELA** WS 11-12.9 MP 1,2,3,4,5,6 HSN-Q 1-3 **Math**	Text ch 5 Force reference sheet Video clips for Newton's Laws Excel project on friction Castle learning Physics classroom

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Forces and motion in 2D **November thru Thanksgiving break**	• Motion along an inclined plane including calculations and free-body diagrams • Projectile motion calculations and predictions • Uniform circular motion	• Friction on an inclined plane • Shoot for your grade • Marshmallow catapult	• Test ch 7	1.M1.1 1.S 1 1.S2.1-4 1.S3.1,3,4 1.TI.1 6.M2.1-4 6.PC5.1,2 6.O 7.S2 5.1 iv, v ,vii, viii, x ,xi	RST 11-12 .1 RST 11-12 .7 WS 11-12.2 WS 11-12.7 **ELA** WS 11-12.8 WS 11-12.9 MP 1-7 HSN-Q 1-3 HV-NM 1-4 **Math** HG-SRT 8	Text ch 7 Myth busters bullet Class demo projectile Castle learning Physics classroom
Universal Gravitation **Thanksgiving break thru end of Nov.**	• Describe gravity and gravitational fields • Distinguish between inertial mass and gravitational mass • Working with relationships and calculations for Newton's Law of Universal gravitation	• Determining the acceleration due to gravity	• Test ch 8	1.S2.1,4 1.S3.3 6.M2.2,3 5.1 iii	RST 11-12.7 **ELA** MP 1-6 HSN-Q 1-3 Math	Text ch 8 Video clips on Einstein's theory of relativity Castle learning Physics classroom

Unit and Approximate time	Skills	Lab Activities	Major Assessments	Physics Learning Standards	Common Core Learning Stds.	Resource/Text Page
Momentum and it's conservation **Thru winter break**	• Determine the momentum of an object • Determine the impulse given to an object • Relate Newton's 3rd Law to the conservation of momentum in collisions and explosions • Use vector analysis to solve conservation of momentum problems in 2-D	• The Explosion • Conservation of momentum in a collision • Exercise in impulse	• Test ch 9	1.M1.1 1.M2.1 1.S1 1.S2.1-4 1.S3.1,3,4 1.T1.1 6.O 7.S2 5.1 xii	WS 11-12.2,7,8 **ELA** MP 1-6 HSN-Q 1-3 **Math**	Text ch 9 Newton's cradle demo Determining the velocity of a softball using the law of conservation of momentum Insurance application car crashes Myth busters conservation of momentum video Castle learning Physics classroom
Energy and work **Jan.**	Calculating work by a force Calculating power Understanding the work/energy theorem Finding the kinetic, potential and internal energy of a system Verifying the law of conservation of energy	Factors that affect the period of a pendulum Quantum leap Hooke's law Work due to friction on a track Pocket labs – working out and inclined plane People power Design your own physics lab –down the ramp	Test ch 10 and 11	1.M1.1 1.M2.1 1.M3.1 1.S2.1 1.S3.1,3,4 4.1 i, ii, iii, iv, v, vii 5.1 xiii	WS 11-12. 2,7,9 **ELA** MP 1-6 HSN-Q 1-3 **Math** HA-CED 1,2 HA-REI 10 HF-IF 4,6,7 HF-LE 1 HS-ID 6-9	Text ch 10 and 11 Castle learning Physics classroom

Unit and Approximate time	Skills	Lab Activities	Major Assessments	Physics Learning Standards	Common Core Learning Stds.	Resource/Text Page
Wave properties and sound **Thru Feb. break**	• Identify how waves transfer energy • Contrast transverse and longitudinal waves • Describe how waves are reflected and refracted • Predict superposition pattern • Understand interference • Identify the properties of sound • Understand the Doppler effect and its applications • Resonance in air columns	• Transverse waves • Speed of sound	• Test ch 14 and 15	1.M1.1 1.M2.1 1.S3.1 2.IS1.3 2.IS1.5 4.3 i, ii, iii, iv, v, vi	RST 11-12 .1 RST 11-12 .7 **ELA** MP 1-6 HSN-Q 1-3 HAS-REI 10 **Math** HF-LE 1 HF-TF 5 HSS-ID 6	Text ch 14 and 15 Physics classroom website for animations Video clips and animations demonstrating wave properties Article – Fact or Fiction – An Opera Singers Voice can shatter glass Myth busters video breaking glass Castle learning Physics classroom
Reflection and Refraction **Thru first week in Mar.**	Speed of light and light as a wave Reflection ray diagrams Refraction ray diagrams and Snell's law Critical angle Dispersion and LASERs Diffraction Polarization	• Reflection lab • Snell's law • Refraction with a triangle • Polarization of light	• Test ch 17 and 19	1.M 1.1 1.S3.1,3 2.IS1.3 2.IS1.5 4.3 vii, viii, ix	RST 11-12. 7 WS 11-12.2 ELA MP 1-6 HSN-Q 1-3	Ch 17 and 19 Youtube video clips Reflection/Refraction animations Snell's Law song 2009 Nobel Winner for fiber optics video Castle learning Physics classroom

Unit and Approximate time	Skills	Lab Activities	Major Assessments	Physics Learning Standards	Common Core Learning Stds.	Resource/Text Page
Static electricity **Thru third week in Mar.**	• Current model of the atom and its development • Conductors vs. insulators • Understanding relationships and performing calculations with Coulomb's law • Charging objects and determining charge on an object • Modeling electric fields	• Sticky tape • Simple electroscope • electrophorous	• Test ch 20 and 21	1.M1.1 1.M2.1 1.S1 1.S2.1,4 1.S31,4 2.SI1.3	RST 11-12.7 WS 11-12.2 ELA MP 1,2,4,5 HSN-Q 1-3 **Math** HF-LE 1,3	Text ch 20 and 21 Van de Graff Video clips on van de Graff and Faraday Castle learning Physics classroom
Current Electricity **Thru Spring break**	• Diagram and construct simple series and parallel circuits • Measure/calculate the electric potential of a circuit • Measure/calculate electric current • Measure/calculate resistance in a circuit	Lighting up and running out Series and Parallel resistance Batteries and Bulbs Circuit practical Unknown resistor	• Test ch 22 and 23	1M1.1 1.M2.1 1.M3.1 1.S1 1.S2.1,4 1.S3.1,3,4 4.1 viii, ix, x, xi, xii, xiii, xiv	WS 11-12.2 WS 11-12.7 ELA MP 1-6 HSN-Q 1-3 **Math** HA-REI 10 HF-IF 4,6,7 HS-ID 6-9	Text Ch 22 and 23 Castle learning Physics classroom

Unit and Approximate time	Skills	Lab Activities	Major Assessments	Physics Learning Standards	Common Core Learning Stds.	Resource/Text Page
Magnetic fields and electromagnetic induction **Thru the beginning of May**	• Describe the properties of magnets • Compare magnetic fields • Map field lines • Understand electromagnetic induction	• The nature of magnetism • Electromagnetic fishing pole	• Test ch 24-26	1.S 1 1.S 2.1-4 1.S3.3,4 4.1 xv	RST 11-12.1 RST 11-12.7 WS 11-12.2 ELA WS 11-12.7 WS 11-12.8 WS 11-12.9 MP 1-8 HSN-Q 1-3 **Math**	Text ch 24 -26 Castle learning Physics classroom
Modern Physics **Thru Memorial Day**	• To introduce the concepts of quantum theory • To understand the standard model of the atom • To solve energy level problems • To understand the dual nature of light	• Rocket launch	• Test 27,28,30	1.S1 1.S2.1-4 1.S3.1,4 1.T1.1 2.IS1.3,5 6.M2.1-4 6.O 5.3 i, ii	RST 11-12.1 RST 11-12.7 WS 11-12.2 ELA WS 11-12.7 WS 11-12.8 WS 11-12.9 MP 1-8 HSN-Q 1-3 **Math**	Text Ch 27,28,30 Web demonstrations and animations of spectral data Jigsaw web activity Black hole article Castle learning Physics classroom
Review **Thru the end of classes**	• Review will be based on student concerns and teacher's analysis of weak areas as seen by recent cumulative test • Most common questions on the regents will also be highlighted as well as the most difficult past questions	Review project	• Physics Regents	1.M 1.1 1.M2.1 1.M3.1 2.IS 1.2 4.1, 4.3, 5.1, 5.3 all reviewed	RST 11-12.1 RST 11-12.7 ELA MP 1 HSN-Q 1-3 **Math** HN-VM 1-3 HS A-APR 1 H A-CED 1,2 H A-REI 10 HS F-IF 4,6,7 HF-LE 1,3 HF-TF 5 HG-SRT 5,8 HS –ID 6, 7,8,9	Class presentations Castle learning