CURRICULUM MAP
Physics

Weeks 1-3	Weeks 4-6	Weeks 7-9	Weeks 10-12	Weeks 13-15	Weeks 16-18
Brief Review Forces and Motion Grade 9 Indicators 21-25 Nature of Energy Grade 9 Indicators 12-13 **Forces and Motion** 12-5. Use and apply the laws of motion to analyze, describe and predict the effects of forces on the motions of objects mathematically. 12-9. Describe how gravitational forces act between all masses and always create a force of attraction. Recognize that the strength of the force is proportional to the masses and weakens rapidly with increasing distance between them. **Prerequisites** **Active Physics** **Biology** **Algebra I-II** **Credit 1.0** **Double-Blocked** **Semester Course**	Brief Review Nature of Matter Grade 9 Indicators 1,2,5,9 **Nature of Matter** 12-1. Explain how atoms join with one another in various combinations in distinct molecules or in repeating crystal patterns. **Nature of Energy** 12-12. Describe how different atomic energy levels are associated with the electron configurations of atoms and electron configurations (and/or conformations) of molecules.	Brief Review Nature of Energy Grade 9 Indicators 11,14,15,16,17 **Forces and Motion** 11-3. Describe real world examples showing that all energy transformations tend toward disorganized states (e.g., fossil fuel combustion, food pyramids and electrical use).	Brief Review Nature of Energy Grade 9 Indicators 18-20 **Forces and Motion** 12-6. Recognize that the nuclear forces that hold the nucleus of an atom together, at nuclear distances, are stronger than the electric forces that would make it fly apart. 12-7. Recognize that nuclear forces are much stronger than electromagnetic forces, and electromagnetic forces are vastly stronger than gravitational forces. The strength of the nuclear forces explains why greater amounts of energy are released from nuclear reactions (e.g., from atomic and hydrogen bombs and in the sun and other stars). 12-8. Describe how the observed wavelength of a wave depends upon the relative motion of the source and the observer (Doppler Effect)). If either is moving towards the other, the observed wavelength is shorter; if either is moving away, the observed wavelength is longer (e.g., weather radar, bat echoes and police radar).	Brief Review Nature of Matter Grade 9 Indicators 3, 10 **Forces and Motion** 11-4. Explain how electric motors and generators work (e.g., relate that electricity and magnetism are two aspects of a single electromagnetic force). Investigate that electrical charges in motion produce magnetic fields and a changing magnetic field creates an electric field. **Nature of Matter** 12-13. Explain how atoms and molecules can gain or lose energy in particular discrete amounts (quanta or packets); therefore, they can only absorb or emit light at the wavelengths corresponding to these amounts. 11-1. Explain that elements with the same number of protons may or may not have the same mass and those with different masses (different numbers of neutrons) are called isotopes. Some of these are radioactive.	**Nature of Energy** 12-10. Explain the characteristics of isotopes. The nuclei of radioactive isotopes are unstable and spontaneously decay emitting particles and/or wavelike radiation. It cannot be predicted exactly when, if ever, an unstable nucleus will decay, but a larger group of identical nuclei decay at a predictable rate. 12-11. Use the predictability of decay rates and the concept of half-life to explain how radioactive substances can be used in estimating the age of materials. **Historical Perspectives / Scientific Revolutions** 12-14. Use historical examples to explain how new ideas are limited by the context in which they are conceived; are often initially rejected by the scientific establishment; sometimes spring from unexpected findings; and usually grow slowly through contributions from many different investigators (e.g., nuclear energy, quantum theory and theory of relativity). 12-15. Describe concepts/ideas in physical sciences that have important, long-lasting effects on science and society (e.g., quantum theory, theory of relativity, age of the universe). **10/24/05**