Unit # - 4 - Astronomy

Standards Addressed	Student Learning Objectives For this Unit	Content Skills and Knowledge	Learning Activities and Instructional Strategies
NSES Standards: Earth & Space Science Science as Inquiry Science & Technology History and Nature of Science PA STEE Standards: 3.2.7.A (sci. k) 3.2.7.B (app k) 3.4.7.D (astronomy) 3.4.7.B (e ht trn) 3.1.7.B (models) 3.7.7.B (instr) 1.2 read crit 1.4 writing 1.8 presentation	Students will be able to… Part 1: Astronomy: The Original Science (1 wk) ▪ Describe the contributions of Brahe, Kepler, Galileo, Newton and Hubble to modern astronomy ▪ Compare and contrast refracting and reflecting telescopes ▪ List the types of electromagnetic radiation that astronomers use to study objects in space ▪ Explain how constellations are used to organize the night sky Part 2: Stars, Galaxies, and the Universe (3 weeks) ▪ Describe how color indicates temperature of the stars ▪ Compare absolute magnitude with apparent magnitude ▪ Describe the difference between apparent and real motion of stars ▪ Describe the different types of stars ▪ Describe the evolution of our sun, a low density star, and a high density star ▪ Describe and explain the HR diagram ▪ Identify the various types of galaxies ▪ Describe and explain the Big Bang Theory ▪ Describe briefly how our solar system formed	Part 1: **Knowledge** Astronomy, month, day, year Reflecting and refracting telescope Electromagnetic spectrum Light year **Skills** Compare and contrast the various forms of telescopes Part 2: **Knowledge** Spectrum, apparent and absolute magnitude Parallax Main sequence, white dwarf, red giant, supernova, neutron star, pulsar, black hole Spiral, elliptical, and irregular galaxies Nebula, open and globular cluster quasar Cosmology, big bang theory **Skills** Explain the evolution of stars using the Hertzsprung-Russell diagram	Part 1: **Lab or Demonstration:** Refraction Action Constellation Prize **Reading:** Through the Eye of a Telescope **Worksheet:** Observing the Sky – Directed Reading Observing the Sky - Vocabulary Observing the Sky – Review Stella Star – Ace Reporter **Technology**: Sky View Café http://www.skyviewcafe.com/index.php Part 2: **Lab or Demonstration:** Flame Test Lab Spectroscope Lab **Reading:** Characteristics of Stars Lives of Stars History of the Universe **Worksheet:** Fleabert and the Amazing Watermelon Seed **Technology**: Cosmic Evolution http://www.tufts.edu/as/wright_center/cosmic_evolution/docs/splash.html

Unit # - 4 - Astronomy

Standards Addressed	Student Learning Objectives for this Unit	Content Skills and Knowledge	Learning Activities and Instructional Strategies
NSES Standards: Earth & Space Science Science as Inquiry Science & Technology History and Nature of Science PA STEE Standards: 3.2.7.A (sci. k) 3.2.7.B (app k) 3.4.7.D (astronomy) 3.4.7.B (e ht trn) 3.1.7.B (models) 3.7.7.B (instr) 1.2 read crit 1.4 writing 1.8 presentation	Part 3: Sun – Moon – Earth Dynamics (2 weeks) ▪ Explain how the sun generates energy ▪ Describe the earth's seasons and how they occur. ▪ Explain the cause of tides and their daily cycle ▪ Describe the moon's phases and monthly cycle ▪ Explain lunar and solar eclipses Developmental Considerations for Part 3: ▪ Models (classroom, computer, pictures, demos) should be used to illustrate concepts of seasons, eclipses, and the moon's phases ▪ Emphasize how earth is effected by these dynamics o The sun's **energy** powers all life and many physical phenomena (ex wind, currents) directly and indirectly o Moon's **gravity** creates tides o Earthly **time** has developed from seasonal and moon cycles o Our text is weak in Part 3 materials, teachers should supplement as appropriate. There are many good web sites, check our 8th Grade Course website for links	Part 3: **Knowledge** Nuclear fusion Rotation, revolution Tides: Spring and Neap Umbra, Penumbra Waxing, Waning **Skills** Develop a scale model of the solar system Develop models to assist in learning the eclipses, season's, and the moon's phases	Part 3: **Lab or Demonstration:** The Moon's Phases Create a Calendar **Reading:** Formation of the Solar System Formation of the Solar System – Vocabulary and Notes Review Worksheet **Worksheet:** Phases of the Moon **Technology**: Brainpop: Seasons http://www.brainpop.com/science/weather/seasons/index.weml?&tried_cookie=true Earth-Moon-Sun Dynamics http://www.wcer.wisc.edu/ncisla/muse/earth-moon-sun/intro/index.html

Unit # - 4 - Astronomy

Unit Modifications

Observing the Sky – Directed Reading
Observing the Sky – Vocabulary
Observing the Sky – Review
Formation of the Solar System
Formation of the Solar System – Vocabulary and Notes
Review Worksheet

Unit Enrichments

Stellar Humor
Through the Eye of a Telescope

Suggested Assessment Techniques for Unit

Core 1: Performance Assessment: Alien ph (Chemistry)
Core 2: Performance Assessment: Trouble in Flume Country (Forces and Motion)
Core 3: Unit Assessment: Astronomy

Materials/Technology for Unit

Sky View Café

- http://www.skyviewcafe.com/index.php

Brainpop: Seasons
http://www.brainpop.com/science/weather/seasons/index.weml?&tried_cookie=true