Cornwall-Lebanon School District Curriculum Overview

Astronomy: Grades 10 – 12

20 length of time in weeks	Concepts & Competencies	Common Assessments	Academic Standards (PA Core if applicable)
Unit 1 — 2	**The Celestial Sphere** Students will use altitude and azimuth to locate objects in the night sky. Students will link objects seen in the sky to their relative distances from Earth. Students will explain why the Sun and planets appear to move along the ecliptic. Students will explain nightly and annual apparent motions of the night sky based upon the physical motion of Earth.	➢ Unit 1 Quiz 1: Introduction to Stargazing ➢ Unit 1 Quiz 2: The Celestial Sphere ➢ Unit 1 Test 1: The Celestial Sphere Unit Test	3.3.10.B2 3.3.7.B2 3.3.6.B1 3.3.3.B1
Unit 2 — 4	**Ancient & Classical Astronomy** Students will connect cyclical astronomical patterns to the origin of days, months, and years. Students will explore the significance astronomical patterns had upon ancient civilizations. Students will track solar apparent motion to explain solstices and equinoxes. Students will explain observations that led to a heliocentric model of the solar system.	➢ Unit 2 Quiz 1: Ancient Astronomy & Celestial Motions ➢ Unit 2 Project 1: Ancient Astronomy Site Research ➢ Unit 2 Quiz 2: Classical Astronomers ➢ Unit 2 Test 1: History of Astronomy Unit Test	3.3.10.B1 3.3.7.B2 3.3.5.B1 3.3.4.B2 3.3.3.B1
Unit 3 — 2	**Kepler's Laws of Planetary Motion** Students will use Kepler's Laws to describe planetary motion around the Sun. Students will calculate orbital eccentricity given parameters about various planets, asteroids, and comets. Students will calculate the relationship between a planet's orbital period and its orbital radius.	➢ Unit 3 Quiz 1: Eccentricity ➢ Unit 3 Test 1: Kepler's Laws of Planetary Motion Unit Test ➢ Marking Period Exam	3.2.8.B1 3.2.10.B1 3.2.P.B6
Unit 4 — 3	**Gravity & Laws of Motion** Students will apply Newton's Laws of Motion to describe how objects interact both on Earth and in space. Students will determine the mass of astronomical objects using the Law of Universal Gravitation.	➢ Unit 4 Quiz 1: Galileo & Inertia ➢ Unit 4 Quiz 2: Newton's Laws of Motion ➢ Unit 4 Test 1: Gravity Unit Test	3.2.8.B1 3.2.10.B1 3.2.P.B6
Unit 5 — 3	**Solar System Formation** Students will analyze the influence of gravity on the formation of planetary systems. Students will observe their own solar system to develop a model of how solar systems form in	➢ Unit 5 Quiz 1: Solar System Diagram ➢ Unit 5 Quiz 2: Solar System Objects ➢ Unit 5 Test 1: Solar Nebula Theory Unit Test	3.3.12.B1 3.3.10.B1 3.3.10.B2 3.3.7.B1 3.3.7.B2

	general. Students will compare and contrast the characteristics of objects located within the solar system.		
Unit 6 3	<u>Moon Formation & Interactions</u> Students will provide evidence supporting the Moon's formation via a large impact. Students will identify and explain the appearance of various features on the Moon's surface. Students will model and explain the cause of moon phases, eclipses, and tides.	➢ Unit 6 Quiz 1: Moon Formation & Characteristics ➢ Unit 6 Quiz 2: Moon Phases & Eclipses ➢ Unit 6 Test 1: The Moon Unit Test ➢ Marking Period Exam #2	3.3.6.B2 3.3.7.B2 3.3.7.A4 3.3.10.B1
Unit 7 3	<u>Planetarium Observations</u> Students will identify major constellations, stars, and deep space objects found in the night sky through cumulative planetarium observations.	➢ Cumulative Planetarium Identification Quiz #1-15	NA