

**Newport-Mesa Unified School District
Office of Secondary Curriculum and Instruction
High School Course of Study**

Department	Science			Course Title	Astronomy/Geology		
Course Code		Grade Level	11 and 12 th			Course Length	1 year
Credits/Semester	5.0/10.0	Required for Graduation		No		Elective Credit	Yes
Prerequisites	Biology and chemistry/ or physics/ or earth science and completion of geometry						
Community College Articulation			Name of College				
UC/CSU Articulation			Name of University				
Meets UC/CSU “a-g” Requirement		Yes	Meets NCAA Requirement			Honors Grading Differentiation	No

COURSE DESCRIPTION

This is an interdisciplinary, integrated, year-long lab course in which students will learn about our solar systems, stars, the galaxies and the universe during the astronomy section. During the geology portion of the course students will investigate geologic phenomena and acquire laboratory skills involving mineral and rock identification, geophysics geomorphology, geologic history, mapping plate tectonics, oceanography, and meteorology.

GOALS: (Expected performance outcomes for students)

Mastery of all standards identified as high and medium frequency standards on the California Standards Tests, with a concerted effort to encourage mastery of low frequency standards as well. **(For subjects without board adopted and approved state standards list in bullet form the goals of your department’s course of study.)**

California Content Standards

The following abbreviations are included to indicate the assessments used to measure a student’s proficiency in each of the appropriate standards: California Standards Test (CST); California High School Exit Exam (CAHSEE); Practice Scholastic Aptitude Test/National Merit Scholarship Qualifying Test (PSAT/NMQST). Standards that are underlined and in bold are identified as high frequency standards on the CST. Standards that are in bold are identified as medium frequency standards on the CST.

Evaluation

Student achievement will be measured using multiple assessment tools, included but not limited to benchmark test results, final exams, end-of-unit tests, quizzes, homework, classwork, notebooks, portfolios, authentic performance assessments, and written assessments using the district’s rubric. District-wide benchmark assessments will be assessed using the following chart:

Performance Standards - Benchmark Assessments				
Far Below Basic = F	Below Basic = D	Basic = C	Proficient = B	Advanced Proficient = A

Course Outline

Unit 1	Course Title					
	Key Terms	Standards*		Model Tasks**	Tools & Text	
Astronomy and the Universe 6 weeks Subtopics: • The Foundations of Astronomy • The birth of modern science • Radiation • Spectroscopy • The tools of astronomy	-Astronomy -Scientific method -Celestial sphere -Sidereal year -Triangulation -Cosmic distance scale -Parallax -Geocentric -Heliocentric -Laws of Planetary Motion - Astronomical unit -Inertia -Gravity -Electromagnetic radiation/spectrum -Temperature -Doppler effect -Spectrum -Telescopes	Earth Science 1a-f I & E a-g, i-n Physics 1a-g, 4a-f Earth Science 1g	H M L	Hand-angle measurements activity, triangulation and parallax activity, celestial sphere activity, moon phases observations, Kepler's Laws activities, demonstrations of Newton's 3 Laws, wave activities and demonstrations, spectroscopy lab, telescope project, telescope observations, virtual astronomy labs	D C B A	Textbook and related materials, lab manual and required lab equipment, computer with internet
Differentiation	Support – for students struggling with content	Content: Multiple supplementary materials Process: graphic organizers, conceptual drawings, varied reading materials based on readiness and learning styles, direct instruction, mixed grouping, collaborative work, tiered tasks, additional teaching time before school or during tutoring time, use of various teaching modalities, varied questioning strategies, and varied reading strategies Product: lab reports, homework, projects, current events, student choice of type of demonstration of mastery, and presentations				
	Extension – for high achieving students. Required activities for all honors courses.	Content: Multiple supplementary materials Process: Projects, extra credit for going beyond the rubric on a project, peer tutoring (those who teach learn it better), bonus/extension problems, student presentations (higher achieving students can extend the project with extra elements such as video or powerpoint), current event connections from research. Product: lab reports, homework, projects, current events, student choice of otype of demonstration of mastery, and presentations				

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Evaluation	Formative Assessments: Review games, think-pair-share, KWL charts, quiz, homework check, concept checks. Summative Assessments: Tests, lab reports, writing assessment or essay, presentations, projects.	

a Standards are to be identified by frequency on California Standards Tests. A high frequency standard will be labeled with an “H”, a medium frequency standard will be labeled “M”, and a low frequency standard will be labeled “L”.

** Tasks are to be identified by the Application Taxonomy Quadrant designed by the International Center for Leadership in Education.

Unit 3	Course Title				
	Key Terms	Standards*		Model Tasks**	Tools & Text
Stars and Stellar Evolution 8 weeks Subtopics: - The Sun - Red Giants and White Dwarfs - The Interstellar Medium - Star Formations - Stellar Evolution - Stellar Explosions - Neutron Stars and Black Holes	-Apparent/absolute magnitude -Luminosity -Fusion -Hydrostatic equilibrium -Main sequence -Solar Oscillations -Stellar Motion -Interstellar medium -Nebula -Supernova -Neutron star -Pulsar -Black hole	Earth Science 2a-d	H	Comparison of apparent/absolute magnitudes, Observing the Sun – Size of the Sun lab, virtual astronomy labs, interpret H-R diagram, star analysis, diagram life/death sequence of stars, supernova core bounce model and analysis, key term activities, spectral analysis and classification of stars, problem-solving, analyze stellar equilibrium in terms of gravity and gas laws/How is a Star like a balloon acitivity	D C B A Textbook and related materials, lab manual and required lab equipment, computer with internet
		I & E a-g, i-n			
		Physics 4a-f			
			M		
		Earth Science 2f-g, 1e	L		

Differentiation	Support -- for students struggling with content	Content: Multiple supplementary materials Process: graphic organizers, conceptual drawings, varied reading materials based on readiness and learning styles, direct instruction, mixed grouping, collaborative work, tiered tasks, additional teaching time before school or during tutoring time, use of various teaching modalities, varied questioning strategies, and varied reading strategies Product: lab reports, homework, projects, current events, student choice of type of demonstration of mastery, and presentations
	Extension – for high achieving students. Required activities for all honors courses.	Content: Multiple supplementary materials Process: Projects, extra credit for going beyond the rubric on a project, peer tutoring (those who teach learn it better), bonus/extension problems, student presentations (higher achieving students can extend the project with extra elements such as video or powerpoint), current event connections from research. Product: lab reports, homework, projects, current events, student choice of otype of demonstration of mastery, and presentations
Evaluation	Formative Assessments: Review games, think-pair-share, KWL charts, quiz, homework check, concept checks. Summative Assessments: Tests, lab reports, writing assessment or essay, presentations, projects.	

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Unit 4	Course Title				
	Key Terms	Standards*		Model Tasks**	Tools & Text
Galaxies and Cosmology 6 weeks Subtopics:	-Galaxy -Dark halo -Dark matter -Hubble's Law -Quasars -Cosmology -Cosmological	Earth Science 1a-e I & E a-g, i-n	H	Classify galaxies, Milky Way Galaxy activity, determine the distances to nearby galaxies, Hubble's law and the expanding universe activity, virtual labs	Textbook and related materials, lab manual and required lab equipment, computer

