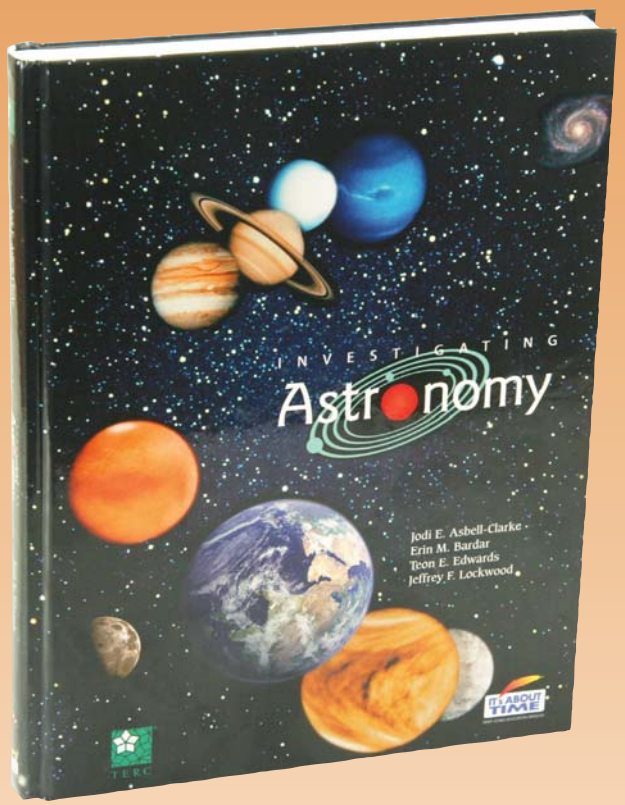
Investigating Astronomy

CORRELATION TO THE FLORIDA CONTENT STANDARDS

Subject:	Science
Grade Level:	9–12
Course Title:	Astronomy Solar/ Galactic



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Investigating Astronomy Correlation to the Florida Content Standards Astronomy Solar/Galactic, Grades 9-12

Benchmarks	Location/Page where Benchmark is found
LA.910.2.2.3 The student will organize information to show understanding or relationships among facts, ideas, and events (e.g., representing key points within text through charting, mapping, paraphrasing, summarizing, comparing, contrasting, or outlining);	29, 37, 41, 51, 56-65, 83-89, 99, 101, 107, 207, 294, 308, 348, 356, 372, 374, 389
LA.910.4.2.2 The student will record information and ideas from primary and/or secondary sources accurately and coherently, noting the validity and reliability of these sources and attributing sources of information;	107, 207
MA.912.S.1.2 Determine appropriate and consistent standards of measurement for the data to be collected in a survey or experiment.	9, 159, 282
MA.912.S.3.2 Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following: bar graphs, line graphs, stem and leaf plots, circle graphs, histograms, box and whisker plots, scatter plots, cumulative frequency (ogive) graphs	13, 28, 41, 47, 69, 83-84, 100, 113, 168-169, 289, 316, 325, 327, 329, 336, 383, 423
SC.912.E.5.1 Cite evidence used to develop and verify the scientific theory of the Big Bang (also known as the Big Bang Theory) of the origin of the universe.	225, 359
SC.912.E.5.2 Identify patterns in the organization and distribution of matter in the universe and the forces that determine them.	Triplet Game, 305, 356-57, 360
SC.912.E.5.3 Describe and predict how the initial mass of a star determines its evolution.	312-315
SC.912.E.5.4 Explain the physical properties of the Sun and its dynamic nature and connect them to conditions and events on Earth.	74, 76, 83, 85
SC.912.E.5.5 Explain the formation of planetary systems based on our knowledge of our Solar System and apply this knowledge to newly discovered planetary systems.	160-161

Benchmarks	Location/Page where Benchmark is found
SC.912.E.5.6 Develop logical connections through physical principles, including Kepler's and Newton's Laws about the relationships and the effects of Earth, Moon, and Sun on each other.	166-167, 170-171
SC.912.E.5.7 Relate the history of and explain the justification for future space exploration and continuing technology development.	175-179
SC.912.E.5.8 Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools.	224-228, 246-247
SC.912.E.5.9 Analyze the broad effects of space exploration on the economy and culture of Florida.	
SC.912.E.5.11 Distinguish the various methods of measuring astronomical distances and apply each in appropriate situations.	366, 368-369, 377, 380-382, 384-385, 391-395, 399-402, 427
SC.912.E.6.2 Connect surface features to surface processes that are responsible for their formation.	85, 326
SC.912.E.7.7 Identify, analyze, and relate the internal (Earth system) and external (astronomical) conditions that contribute to global climate change .	151-152
SC.912.N.1.1 Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: 1. pose questions about the natural world, 2. conduct systematic observations, 3. examine books and other sources of information to see what is already known, 4. review what is known in light of empirical evidence, 5. plan investigations, 6. use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), 7. pose answers, explanations, or descriptions of events, 8. generate explanations that explicate or describe natural phenomena (inferences), 9. use appropriate evidence and reasoning to justify these explanations to others, 10. communicate results of scientific investigations, and evaluate the merits of the explanations produced by others.	14, 21, 56-65, 99, 206-207, 268-269, 399-403

Benchmarks	Location/Page where Benchmark is found
SC.912.N.1.2 Describe and explain what characterizes science and its methods.	iii
SC.912.N.1.3 Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.	Iii, and at the end of each unit (Revisiting Your Claims)
SC.912.N.1.4 Identify sources of information and assess their reliability according to the strict standards of scientific investigation.	
SC.912.N.1.5 Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.	
SC.912.N.1.6 Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.	338
SC.912.N.1.7 Recognize the role of creativity in constructing scientific questions, methods and explanations.	
SC.912.N.2.1 Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).	iii
SC.912.N.2.2 Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.	
SC.912.N.2.3 Identify examples of pseudoscience (such as astrology, phrenology) in society.	43
SC.912.N.2.4 Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.	iii

Benchmarks	Location/Page where Benchmark is found
SC.912.N.2.5 Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.	142, 420
SC.912.N.3.1 Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.	iii
SC.912.N.3.2 Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.	
SC.912.N.3.3 Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.	166-167
SC.912.N.3.4 Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.	iii
SC.912.N.3.5 Describe the function of models in science, and identify the wide range of models used in science.	V, 16, 23, 34, 42, 73, 80, 87, 89, 94, 108, 138, 335
SC.912.N.4.1 Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.	
SC.912.P.8.1 Differentiate among the four states of matter.	
SC.912.P.8.4 Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.	193, 288-290
SC.912.P.10.4 Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter.	

Benchmarks	Location/Page where Benchmark is found
SC.912.P.10.9 Describe the quantization of energy at the atomic level.	257
SC.912.P.10.11 Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.	288-289, 314-315
SC.912.P.10.18 Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.	224-228, 231, 235
SC.912.P.10.19 Explain that all objects emit and absorb electromagnetic radiation and distinguish between objects that are blackbody radiators and those that are not.	267-268
SC.912.P.10.20 Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.	232-233
SC.912.P.10.21 Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.	204, 392
SC.912.P.10.22 Construct ray diagrams and use thin lens and mirror equations to locate the images formed by lenses and mirrors.	
SC.912.P.12.2 Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.	
SC.912.P.12.4 Describe how the gravitational force between two objects depends on their masses and the distance between them.	90-91, 144-145, 310
SC.912.P.12.6 Qualitatively apply the concept of angular momentum.	
SC.912.P.12.7 Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.	234, 358

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