

Alignment of Alien Rescue with the Texas Essential Knowledge and Skills (TEKS)

Alien Rescue was designed to meet the learning goals set out in the National Science Standards and TEKS. The following is a sample chart that identifies the features of Alien Rescue that address these standards.

TEKS 2010-2011, SCIENCE, GRADE 6		ALIEN RESCUE
(1) The student, for at least 40% of instructional time, conducts laboratory and field investigations following safety procedures and environmentally appropriate and ethical practices.	(A) demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards (B) practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials.	Students deal with budgetary constraints in the design of their probes, making it necessary to make wise choices and conserve their resources.
(2) The student uses scientific inquiry methods during laboratory and field investigations.	(A) plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology; (B) design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology (C) collect and record data using the International System of Units (SI) and qualitative means <i>such as</i> labeled drawings, writing, and graphic organizers (D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns (E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	Students plan and implement investigations throughout their work in Alien Rescue. They ask questions about the worlds in our solar system based on what the different species need, gather information from existing databases to develop hypotheses about the suitability of a world for a particular species, and select the scientific instruments necessary to gather the information they need to test their hypotheses. In their solution, students construct explanations for their decisions using the data they have collected as evidence. Students communicate their decisions using an online solution form such as the Message tool.
(3) The student uses critical thinking , scientific	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical	As students discuss their hypotheses, investigation plans, and findings with their classmates, they engage in critique

<p>reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists.</p>	<p>reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student</p> <p>(B) use models to represent aspects of the natural world <i>such as</i> a model of Earth's layers;</p> <p>(C) identify advantages and limitations of models <i>such as</i> size, scale, properties, and materials</p> <p>(D) relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.</p>	<p>of both their own and others' ideas. They support their opinions with scientific evidence gained through their investigations.</p> <p>Galileo's contribution to the study of our solar system is discussed in several sections of the solar system database. Teachers are also encouraged to weave this information into class discussions.</p> <p>Class discussion in Alien Rescue often turns to technological advancement and the impact of these changes on society.</p> <p>Students read about the history of space flight in the missions database, and use this information as a model in their design of probes.</p>
<p>(4) The student knows how to use a variety of tools and safety equipment to conduct science inquiry.</p>	<p>(A) use appropriate tools to collect, record, and analyze information, including journals/notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, triple beam balances, microscopes, thermometers, calculators, computers, timing devices, and other equipment as needed to teach the curriculum</p> <p>(B) use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.</p>	<p>Students collect information about the solar system using virtual tools, including a thermometer, barometer, magnetometer, mass spectrometer, spectrograph, seismograph, RADAR, and infrared, narrow angle, and wide angle cameras. Students record information in an online notebook.</p> <p>Data returned from the instruments is presented in a variety of formats, including, percents, averages, and ranges.</p>
<p>(5) The student knows the differences between elements and compounds.</p>	<p>(A) know that an element is a pure substance represented by chemical symbols</p> <p>(C) differentiate between elements and compounds on the most basic level</p> <p>(D) identify the formation of a new substance by using the evidence of a possible chemical change <i>such as</i> production of a gas, change in temperature, production of a</p>	<p>Students use spectra to identify the elements the alien species need in the atmospheres and surfaces of their new home worlds. While students do not study spectroscopy in depth, they recognize that every element has a spectral signature, and that this fact can be used to gather useful information.</p>

	precipitate, or color change.	
(8) The student knows force and motion are related to potential and kinetic energy.	(A) compare and contrast potential and kinetic energy (B) identify and describe the changes in position, direction, and speed of an object when acted upon by unbalanced forces (C) calculate average speed using distance & time measurements (D) measure and graph changes in motion	Students read about and discuss the forces that shape Io, a moon of Jupiter. They learn how Jupiter’s gravitational pull causes volcanic activity on Io, and contrast Io with Earth.
(9) The student knows that the Law of Conservation of Energy states that energy can neither be created nor destroyed, it just changes form.	(A) investigate methods of thermal energy transfer, <i>including</i> conduction, convection, and radiation	Students learn that the sun’s energy travels to Earth, which is called ‘radiation.’ They recognize radiation as one of the three ways of heat transfer by electromagnetic waves, which includes visible light, infrared, and ultraviolet radiation. Discussion includes ‘what other ways thermal energy can transfer?’
(10) The student understands the structure of Earth, the rock cycle, and plate tectonics.	(A) build a model to illustrate the structural layers of Earth, <i>including</i> the inner core, outer core, mantle, crust, asthenosphere, and lithosphere	Students learn about the atmospheres of other worlds in our solar system and compare it to their prior knowledge of Earth’s atmosphere.
(11) The student understands the organization of our solar system and the relationships among the various bodies that comprise it.	(A) describe the physical properties, locations, and movements of the Sun, planets, Galilean moons, meteors, asteroids, and comets; (C) describe the history and future of space exploration, <i>including</i> the types of equipment and transportation needed for space travel	Students discuss the differences between planets and moons. Students learn that craters are the result of the impact of meteorites, and that the characteristics of a world determine what happens to craters. Students identify the characteristics of a world that define it, including atmospheric and surface features, chemical composition, temperature, magnetic field, and seismic activity. As students design probes, they learn about probe types, communication devices, power sources, and instruments that are used in the exploration of our solar system. They use the mission database to learn about the equipment used in space travel in the past.
(12) The student knows all organisms are classified into	(E) describe biotic and abiotic parts of an ecosystem in	Students identify components of the ecosystems on the alien worlds that are essential to their survival. They seek

Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem.	which organisms interact	worlds in our solar system with similar ecosystems where the alien species will be able to survive and adapt.
(12) The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem.	(F) diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem	Students study the alien species to determine their needs. The teacher is encouraged to help students compare these species to ones on Earth to account for their structures. Discussion often includes an examination of how each species adapted to its environment and how these adaptations in turn affected their development of technology.

TEKS 2010-2011, SCIENCE, GRADE 7		ALIEN RESCUE
(6) The student knows that matter has physical and chemical properties and can undergo physical and chemical changes.	(A) identify that organic compounds contain carbon and other elements <i>such as</i> hydrogen, oxygen, phosphorus, nitrogen, or sulfur;	Students read about spectra and learn matters comprise of compounds and how they can detect/know their compounds.
(9) The student knows components of our solar system.	(A) analyze the characteristics of objects in our solar system that allow life to exist <i>such as</i> the proximity of the Sun, presence of water, and composition of the atmosphere; (B) identify the accommodations, considering the characteristics of our solar system, that enabled manned space exploration.	Students learn about the components of solar system: the Sun, the planets, the moons orbiting the planets, and asteroids and analyze the characteristics. They seek criteria to classify the planets, including physical characteristics and the distance from the Sun.
(12) The student knows that living systems at all levels of organization demonstrate the complementary nature of	(B) identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems	Students learn about the body and the functions of the alien species. They discuss what functions are different from the human being for each species and which planets are appropriate to enable these species to function. By

structure and function		comparing aliens to the human being, they identify the functions of the systems of the human organism.
(13) The student knows that a living organism must be able to maintain balance in stable internal conditions in response to external and internal stimuli.	(A) investigate how organisms respond to external stimuli found in the environment <i>such as</i> phototropism and fight or flight (B) describe and relate responses in organisms that may result from internal stimuli <i>such as</i> wilting in plants and fever or vomiting in animals that allow them to maintain balance.	Students identify the biological characteristics and the habitats of alien species and compare how aliens adapt to certain environments. They investigate what kinds of internal and external stimuli each alien responds to.

TEKS 2010-2011, SCIENCE, GRADE 8		ALIEN RESCUE
(7) The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon.	(A) model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons	Students read about the Sun, Earth, and Moon in the solar system database and illustrate where each object locates in our solar system and their revolution and rotation. Based on their model, they discuss how seasons and the length of the day are caused by the tilt and rotation of the Earth as it orbits the Sun.
(8) The student knows characteristics of the universe.	(C) explore how different wavelengths of the electromagnetic spectrum <i>such as</i> light and radio waves are used to gain information about distances and properties of components in the universe	Students read about radio waves and electromagnetic spectrum and get to know that spectra are divided by wavelengths. They learn how they notice radio waves in the real world.
(9) The student knows that natural events can impact Earth systems.	(C) interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering.	Students read about ‘Craters,’ impacts by meteors, in the concept database. They recognize natural events such as wind, water, and volcanoes destroy or cover craters. They discuss how weathering, erosion, or internal forces can impact the shape of craters.
(11) The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems.	(B) investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors <i>such as</i> quantity of light, water, range of temperatures, or soil composition	Students learn about the characteristics of each planet in the solar system and investigate the potential and the requirements to support life. They discuss what criteria are required to sustain life.