



Alignment Document
State of Florida and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
SC.A The Nature of Matter	SC.A.1.3.1 The student identifies various ways in which substances differ (e.g., mass, volume, shape, density, texture, and reaction to temperature and light).	SC.A.1.3.1.1 determines the physical properties of matter that can be observed without altering the substance (for example, mass, volume, boiling point, density).	Lesson 3 Atoms and the Properties of Matter
		SC.A.1.3.1.2 knows the difference between transparent, translucent, and opaque objects.	
	SC.A.1.3.2 The student understands the difference between weight and mass.	SC.A.1.3.2.1 understands that weight will vary with the location of the mass in the universe, but the mass will remain constant.	
	SC.A.1.3.3 The student knows that temperature measures the average energy of motion of the particles that make up the substance.	SC.A.1.3.3.1 knows that the average kinetic energy of the atoms or molecules of different objects varies with their temperature.	
	SC.A.1.3.4 The student knows that atoms in solids are close together and do not move around easily; in liquids, atoms tend to move farther apart; in gas, atoms are quite far apart and move around freely.	SC.A.1.3.4.1 understands that changes in energy cause phase changes.	
	SC.A.1.3.5 The student knows the difference between a physical change in a substance (e.g., altering the shape, form, volume, or density) and a chemical change (i.e., producing new substances with different characteristics).	SC.A.1.3.5.1 knows how to use clues (for example, change in color or form) to determine whether a change is chemical or physical.	
	SC.A.1.3.6 The student knows that equal volumes of different substances may have different masses.	SC.A.1.3.6.1 determines the relationship between mass and volume of an assortment of common substances.	

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	SC.A.2.3.1 The student describes and compares the properties of particles and waves.	SC.A.2.3.1.1 knows that matter is mostly neutral, but that particles can attain a charge by the gain or loss of electrons.	
		SC.A.2.3.1.2 understands the relationship between the energy of a wave and its frequency (the greater the frequency of the wave, the greater the energy of the wave).	Lesson 8: Waves
		SC.A.2.3.1.3 understands the relationship of energy and wavelength to the electromagnetic spectrum.	
	SC.A.2.3.2 The student knows the general properties of the atom (a massive nucleus of neutral neutrons and positive protons surrounded by a cloud of negative electrons) and accepts that single atoms are not visible.	SC.A.2.3.2.1 knows that there is an energy difference between an electron near the nucleus and one further away.	
		SC.A.2.3.2.2 knows that when electrons are transferred from one substance to another, the general properties of both substances change.	
	SC.A.2.3.3 The student knows that radiation, light, and heat are forms of energy used to cook food, treat diseases, and provide energy.	SC.A.2.3.3.1 extends and refines knowledge of uses of forms of energy to improve the quality of life.	Lesson 9: Energy Transfer
SC.B Energy	SC.B.1.3.1 The student identifies forms of energy and explains that they can be measured and compared.	SC.B.1.3.1.1 understands that energy can be transferred by radiation, conduction, and convection.	Lesson 11: Heat Transfer and Review
		SC.B.1.3.1.2 knows examples of natural and man-made systems in which energy is transferred from one form to another.	
	SC.B.1.3.2 The student knows that energy cannot be created or destroyed, but only changed from one form to another.	SC.B.1.3.2.1 understands how the principle of conservation of energy is applied during an energy transfer.	Lesson 10: Thermodynamics
	SC.B.1.3.3 The student knows the various forms in which energy comes to Earth from the Sun (e.g., visible light, infrared, and microwave).	SC.B.1.3.3.1 knows ways to measure the various forms of energy that come from the Sun.	Lesson 12: The Sun's Energy and the Environment

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	SC.B.1.3.4 The student knows that energy conversions are never 100% efficient (e.g., some energy is transformed to heat and is unavailable for further useful work).	SC.B.1.3.4.1 knows that energy conversions are never 100% efficient and that some energy is transformed to heat and is unavailable for further useful work (for example, a food pyramid reflects the energy that is used and lost in each part of a food chain).	Lesson 10: Thermodynamics
		SC.B.1.3.4.2 knows that a transfer of thermal energy occurs in chemical reactions.	
	SC.B.1.3.5 The student knows the processes by which thermal energy tends to flow from a system of higher temperature to a system of lower temperature.	SC.B.1.3.5.1 knows the processes by which thermal energy tends to flow from a system of higher temperature to a system of lower temperature.	
		SC.B.1.3.5.2 knows that the average kinetic energy of the atoms or molecules that make up an object changes when the temperature of the object changes.	
		SC.B.1.3.5.3 understands that energy changes cause weather to change (for example, formation of high and low pressure systems in the atmosphere results from changes in temperature).	
	SC.B.1.3.6 The student knows the properties of waves (e.g., frequency, wavelength, and amplitude); that each wave consists of a number of crests and troughs; and the effects of different media on waves.	SC.B.1.3.6.1 knows that sound travels in a medium (cannot travel in a vacuum), and travels at different speeds through various media.	Lesson 8: Waves
		SC.B.1.3.6.2 knows the parts of a wave (crest, trough, wavelength, amplitude).	Lesson 8: Waves
		SC.B.1.3.6.3 understands that wavelength determines the colors of visible light.	
		SC.B.1.3.6.4 understands that wavelength determines the pitch of sound.	
		SC.B.1.3.6.5 knows that waves vary greatly in character (for example, sound, ultraviolet, infrared, ocean waves).	Lesson 8: Waves

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	SC.B.2.3.1 The student knows that most events in the universe (e.g., weather changes, moving cars, and the transfer of a nervous impulse in the human body) involve some form of energy transfer and that these changes almost always increase the total disorder of the system and its surroundings, reducing the amount of useful energy.	SC.B.2.3.1.1 understands that as energy is transferred from one system to another there is a reduction in the amount of useful energy.	Lesson 10: Thermodynamics
		SC.B.2.3.1.2 knows that energy transfer is not efficient.	Lesson 10: Thermodynamics
	SC.B.2.3.2 The student knows that most of the energy used today is derived from burning stored energy collected by organisms millions of years ago (e.g., nonrenewable fossil fuels).	SC.B.2.3.2.1 understands how fossil fuels are formed in the Earth, why they are nonrenewable, and the advantages and disadvantages of their use.	
SC.C Force and Motion	SC.C.1.3.1 The student knows that the motion of an object can be described by its position, direction of motion, and speed.	SC.C.1.3.1.1 knows that speed, velocity, and acceleration can be calculated, estimated, and defined.	Lesson 7 Gravity
		SC.C.1.3.1.2 knows that the magnitude of linear acceleration can be calculated.	
	SC.C.1.3.2 The student knows that vibrations in materials set up wave disturbances that spread away from the source (e.g., sound and earthquake waves).	SC.C.1.3.2.1 knows ways to measure the frequency of waves.	
		SC.C.1.3.2.2 knows some technological devices that use wave energy (for example, sonar, ultrasound, laser).	
	SC.C.2.3.1 The student knows that many forces (e.g., gravitational, electrical, and magnetic) act at a distance (e.g., without contact).	SC.C.2.3.1.1 knows that many forces act at a distance.	Lesson 6 Force and motion
	SC.C.2.3.2 The student knows common contact forces.	SC.C.2.3.2.1 knows some common contact forces (for example, friction, buoyancy, tension).	
	SC.C.2.3.3 The student knows that if more than one force acts on an object, then the forces can reinforce or cancel each other, depending on their direction and magnitude.	SC.C.2.3.3.1 recognizes the forces that act on a given object.	Lesson 6 Force and motion

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		SC.C.2.3.3.2 knows that the overall effect of a force can be predicted.	Lesson 6 Force and motion
		SC.C.2.3.3.3 knows that forces may be balanced or unbalanced.	
		SC.C.2.3.3.4 understands that unbalanced forces cause objects to accelerate.	
	SC.C.2.3.4 The student knows that simple machines can be used to change the direction or size of a force.	SC.C.2.3.4.1 knows that simple machines can be used to change the direction or size of a force.	
	SC.C.2.3.5 The student understands that an object in motion will continue at a constant speed and in a straight line until acted upon by a force and that an object at rest will remain at rest until acted upon by a force.	SC.C.2.3.5.1 understands that an object in motion will continue at a constant speed and in a straight line until acted upon by a force and that an object at rest will remain at rest until acted upon by a force.	Lesson 6 Force and motion
	SC.C.2.3.6 The student explains and shows the ways in which a net force (that is, the sum of all acting forces) can act on an object (e.g., speeding up an object traveling in the same direction as the net force, slowing down an object traveling in the direction opposite of the net force).	SC.C.2.3.6.1 knows ways in which a net force (for example, the sum of all acting forces) can act on an object (for example, speeding up an object traveling in the same direction as the net force, slowing down an object traveling in the direction opposite of the net force).	Lesson 6 Force and motion
	SC.C.2.3.7 The student knows that gravity is a universal force that every mass exerts on every other mass.	SC.C.2.3.7.1 knows that gravity is a universal force that every mass exerts on every other mass.	Lesson 7 Gravity
SC.D Processes that Shape the Earth	SC.D.1.3.1 The student knows that mechanical and chemical activities shape and reshape the Earth's land surface by eroding rock and soil in some areas and depositing them in other areas, sometimes in seasonal layers.	SC.D.1.3.1.1 uses observations and tests to identify mineral samples.	
		SC.D.1.3.1.2 understands how sedimentary, igneous, and metamorphic rocks are formed and categorized.	
	SC.D.1.3.2 The student knows that over the whole Earth, organisms are growing, dying, and decaying as new organisms are produced by the old ones.	SC.D.1.3.2.1 knows that over the whole Earth, organisms are growing, dying, and decaying and new organisms are being produced.	Lesson 21 Flow of Energy in Nature

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	SC.D.1.3.3 The student knows how conditions that exist in one system influence the conditions that exist in other systems.	SC.D.1.3.3.1 knows ways conditions that exist in one system influence the conditions that exist in other systems (for example, the relationship between mountain building, island formation, and trench formation; interactions between the atmosphere and hydrosphere affect weather patterns).	
	SC.D.1.3.4 The student knows the ways in which plants and animals reshape the landscape (e.g., bacteria, fungi, worms, rodents, and other organisms add organic matter to the soil, increasing soil fertility, encouraging plant growth, and strengthening resistance to erosion).	SC.D.1.3.4.1 extends and refines knowledge of ways in which living things reshape the landscape.	Lesson 32 Introduced species
	SC.D.1.3.5 The student understands concepts of time and size relating to the interaction of Earth's processes (e.g., lightning striking in a split second as opposed to the shifting of the Earth's plates altering the landscape, distance between atoms measured in Angstrom units as opposed to distance between stars measured in light-years).	SC.D.1.3.5.1 understands concepts of time and size relating to the interaction of Earth's processes (for example, the distance between atoms measured in Angstrom units as opposed to distance between stars measured in light-years).	
	SC.D.2.3.1 The student understands that quality of life is relevant to personal experience.	SC.D.2.3.1.1 understands that quality of life is relevant to personal experience.	
	SC.D.2.3.2 The student knows the positive and negative consequences of human action on the Earth's systems.	SC.D.2.3.2.1 knows that legislation can be adopted to protect the Earth from detrimental human activities.	
SC.E Earth and Space	SC.E.1.3.2 The student knows that available data from various satellite probes show the similarities and differences among planets and their moons in the Solar System.	SC.E.1.3.2.1 knows that available data from various satellite probes show similarities and differences among planets and their moons in our Solar System.	
	SC.E.1.3.3 The student understands that our Sun is one of many stars in our galaxy.	SC.E.1.3.3.1 knows the size, temperature, age, and brightness of the Sun compared to some other stars in the Milky Way Galaxy (for example, white dwarfs, red giants).	Lesson 35 Astronomy

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	SC.E.1.3.4 The student knows that stars appear to be made of similar chemical elements, although they differ in age, size, temperature, and distance.	SC.E.1.3.4.1 knows that stars appear to be made of similar chemical elements, although they differ in age, size, temperature, and distance.	Lesson 35 Astronomy
	SC.E.2.3.1 The student knows that thousands of other galaxies appear to have the same elements, forces, and forms of energy found in our Solar System.	SC.E.2.3.1.1 knows that thousands of other galaxies appear to have the same elements, forces, and forms of energy found in our Solar System.	Lesson 35 Astronomy
SC.F Processes of Life	SC.F.1.3.1 The student understands that living things are composed of major systems that function in reproduction, growth, maintenance, and regulation.	SC.F.1.3.1.1 understands that living things are composed of major systems that function in reproduction, growth, maintenance, and regulation.	Lesson 15 Interactions of body systems
	SC.F.1.3.2 The student knows that the structural basis of most organisms is the cell and most organisms are single cells, while some, including humans, are multicellular.	SC.F.1.3.2.1 knows the structures of cells, and their function and ways these mirror the structure and function of multicellular organisms.	
		SC.F.1.3.2.2 understands that cells of unicellular organisms are similar to those of multicellular organisms.	
	SC.F.1.3.3 The student knows that in multicellular organisms cells grow and divide to make more cells in order to form and repair various organs and tissues.	SC.F.1.3.3.1 knows the processes of division, growth, and maturation that occur during the cell cycle.	
	SC.F.1.3.4 The student knows that the levels of structural organization for function in living things include cells, tissues, organs, systems, and organisms.	SC.F.1.3.4.1 knows some of the functions of some types of cells, tissues, organs, and systems in advanced organisms.	
	SC.F.1.3.5 The student explains how the life functions of organisms are related to what occurs within the cell.	SC.F.1.3.5.1 understands that the diversity of cell structure permits a diversity of functions for the organism.	
		SC.F.1.3.5.2 knows that the cell is a system of organelles that mirrors the systems within multicellular organisms.	
	SC.F.1.3.6 The student knows that the cells with similar functions have similar structures, whereas those with different structures have different functions.	SC.F.1.3.6.1 knows that the cells with similar functions have similar structures, whereas those with different structures have different functions.	
		SC.F.1.3.6.2 uses tools to identify and compare cell structures (for example, microscope, hand lenses, bioscopes).	

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	SC.F.1.3.7 The student knows that behavior is a response to the environment and influences growth, development, maintenance, and reproduction.	SC.F.1.3.7.1 knows ways behaviors that are responses to the environment may alter the normal growth, development, maintenance, and reproduction of an organism.	Lesson 16 Adaptation
	SC.F.2.3.1 The student knows the patterns and advantages of sexual and asexual reproduction in plants and animals.	SC.F.2.3.1.1 knows the difference between spores and seeds in plant reproduction.	
		SC.F.2.3.1.2 knows that the flower is the reproductive body of a vascular plant and that it is adapted for pollination.	
		SC.F.2.3.1.3 knows the difference between meiosis and mitosis and when each occurs.	
	SC.F.2.3.2 The student knows that the variation in each species is due to the exchange and interaction of genetic information as it is passed from parent to offspring.	SC.F.2.3.2.1 knows how dominant and recessive traits are inherited.	Lesson 19 Genetics
		SC.F.2.3.2.2 uses a Punnett square to predict the results of crosses between pure and hybrid organisms.	Lesson 20 Genetic Predictions
		SC.F.2.3.2.3 knows that variations within a species are the result of genetic information being passed from a parent to offspring and that interactions between the genes may occur in the process (for example, blending, crossing-over).	Lesson 20 Genetic Predictions
	SC.F.2.3.3 The student knows that generally organisms in a population live long enough to reproduce because they have survival characteristics.	SC.F.2.3.3.1 knows ways organisms are adapted to their environment.	Lesson 16 Adaptation
		SC.F.2.3.3.2 understands that species have characteristics that enable their populations to cycle within varying periods of time (minutes to hundreds of years).	
	SC.F.2.3.4 The student knows that the fossil record provides evidence that changes in the kinds of plants and animals in the environment have been occurring over time.	SC.F.2.3.4.1 knows that the fossil record provides evidence that changes in the kinds of plants and animals in the environment have been occurring over time.	

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SC.G How Living Things Interact with Their Environment	SC.G.2.3.1 The student knows that some resources are renewable and others are nonrenewable.	SC.G.2.3.1.1 knows that some resources are renewable and others are nonrenewable.	Lesson 33 Overpopulation
	SC.G.2.3.3 The student knows that a brief change in the limited resources of an ecosystem may alter the size of a population or the average size of individual organisms and that long-term change may result in the elimination of animal and plant populations inhabiting the Earth.	SC.G.2.3.3.1 understands that changes in the environment cause changes in populations.	Lesson 31 Habitat Desctuction and Pollution
	SC.G.2.3.4 The student understands that humans are a part of an ecosystem and their activities may deliberately or inadvertently alter the equilibrium in ecosystems.	SC.G.2.3.4.1 extends and refines knowledge of ways that human activities may deliberately or inadvertently alter the equilibrium in the ecosystem.	Lesson 31 Habitat Desctuction and Pollution
SC.H The Nature of Science	SC.H.1.3.1 The student knows that scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.	SC.H.1.3.1.1 knows that scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.	
	SC.H.1.3.2 The student knows that the study of the events that led scientists to discoveries can provide information about the inquiry process and its effects.	SC.H.1.3.2.1 extends and refines use of systematic, scientific processes to develop and test hypotheses.	Lesson 1 Scientific theory and science in the world
		SC.H.1.3.2.2 knows that the study of the events that led scientists to discoveries can provide information about the inquiry process and its effects.	
	SC.H.1.3.3 The student knows that science disciplines differ from one another in topic, techniques, and outcomes, but that they share a common purpose, philosophy, and enterprise.	SC.H.1.3.3.1 extends and refines knowledge that science disciplines differ from one another in topic, techniques, and outcomes but that they share a common purpose, philosophy, and enterprise.	
	SC.H.1.3.4 The student knows that accurate record keeping, openness, and replication are essential to maintaining an investigator s credibility with other scientists and society.	SC.H.1.3.4.1 extends and refines use of accurate records, openness, and replication of experiments to ensure credibility.	Lesson 1 Scientific theory and science in the world

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	SC.H.1.3.5 The student knows that a change in one or more variables may alter the outcome of an investigation.	SC.H.1.3.5.1 extends and refines knowledge of how to identify the independent and dependent variables in an experiment.	Lesson 1 Scientific theory and science in the world
		SC.H.1.3.5.2 extends and refines use of appropriate experimental design, with consideration for rules, time, and materials required to solve a problem.	Lesson 1 Scientific theory and science in the world
		SC.H.1.3.5.3 extends and refines use of rules, time, and materials in ways that ensure the identification and separation of variables in an experiment to solve a problem.	Lesson 1 Scientific theory and science in the world
	SC.H.1.3.6 The student recognizes the scientific contributions that are made by individuals of diverse backgrounds, interests, talents, and motivations.	SC.H.1.3.6.1 extends and refines knowledge of selected scientists and their accomplishments and recognizes their varied backgrounds, talents, interests, and goals.	
	SC.H.1.3.7 The student knows that when similar investigations give different results, the scientific challenge is to verify whether the differences are significant by further study.	SC.H.1.3.7.1 extends and refines use of criteria necessary to determine the validity of a scientific experiment.	Lesson 1 Scientific theory and science in the world
		SC.H.1.3.7.2 knows that statistical tests are used to confirm the significance of data.	
	SC.H.2.3.1 The student recognizes that patterns exist within and across systems.	SC.H.2.3.1.1 understands the importance for looking for patterns in natural events.	Lesson 26 The Water Cycle
	SC.H.3.3.1 The student knows that science ethics demand that scientists must not knowingly subject coworkers, students, the neighborhood, or the community to health or property risks.	SC.H.3.3.1.1 knows that science ethics demand that scientists must not knowingly subject coworkers, students, the neighborhood, or the community to health or property risks.	
		SC.H.3.3.1.2 uses appropriate procedures for safety in the classroom, home, and community.	
	SC.H.3.3.2 The student knows that special care must be taken in using animals in scientific research.	SC.H.3.3.2.1 extends and refines knowledge of the care, safe practices, and ethical treatment that are appropriate when using animals in field and laboratory research.	

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	SC.H.3.3.3 The student knows that in research involving human subjects, the ethics of science require that potential subjects be fully informed about the risks and benefits associated with the research and of their right to refuse to participate.	SC.H.3.3.3.1 knows that in research involving human subjects, the ethics of science require that potential subjects be fully informed about the risks and benefits associated with the research and of their right to refuse to participate.	
	SC.H.3.3.4 The student knows that technological design should require taking into account constraints such as natural laws, the properties of the materials used, and economic, political, social, ethical, and aesthetic values.	SC.H.3.3.4.1 knows that technological design should require taking into account constraints such as natural laws, the properties of the materials used, and economic, political, social, ethical, and aesthetic values.	
	SC.H.3.3.5 The student understands that contributions to the advancement of science, mathematics, and technology have been made by different kinds of people, in different cultures, at different times and are an intrinsic part of the development of human culture.	SC.H.3.3.5.1 understands that contributions to the advancement of science, mathematics, and technology have been made by different kinds of people, in different cultures, at different times and are an intrinsic part of the development of human culture.	
	SC.H.3.3.6 The student knows that no matter who does science and mathematics or invents things, or when or where they do it, the knowledge and technology that result can eventually become available to everyone.	SC.H.3.3.6.1 knows that no matter who does science and mathematics or invents things, or when or where they do it, the knowledge and technology that result can eventually become available to everyone.	
		SC.H.3.3.6.2 knows ways the scientific enterprise is global and available to all.	
	SC.H.3.3.7 The student knows that computers speed up and extend people's ability to collect, sort, and analyze data; prepare research reports; and share data and ideas with others.	SC.H.3.3.7.1 uses a variety of technologies to collect, analyze, and report scientific findings.	
		SC.H.3.3.7.2 knows that the quantity of scientific information available is increasing at an exponential rate due to the advances in technology.	