Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
1.0 Students will demonstrate the thinking and acting inherent in the practice of science.	1.A.1 Design, analyze, or carry out simple investigations and formulate appropriate conclusions based on data obtained or provided.	1.A.1.a Explain that scientists differ greatly in what phenomena they study and how they go about their work.	
		1.A.1.b Develop the ability to clarify questions and direct them toward objects and phenomena that can be described, explained, or predicted by scientific investigations.	Lesson 1 Scientific Theory and Science in the World
		1.A.1.c Explain and provide examples that all hypotheses are valuable, even if they turn out not to be true, if they lead to fruitful investigations.	
		1.A.1.d Locate information in reference books, back issues of newspapers, magazines and compact disks, and computer databases.	
		1.A.1.e Explain that if more than one variable changes at the same time in an investigation, the outcome of the investigation may not be clearly attributable to any one of the variables.	Lesson 1 Scientific Theory and Science in the World
		1.A.1.f Give examples of when further studies of the question being investigated may be necessary.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
		1.A.1.g Give reasons for the importance of waiting until an investigation has been repeated many times before accepting the results as correct.	
		1.A.1.h Use mathematics to interpret and communicate data.	
		1.A.1.i Explain why accurate record-keeping, openness, and replication are essential for maintaining an investigator s credibility with other scientists and society.	
	1.B.1 Review data from a simple experiment, summarize the data, and construct a logical argument about the cause-and-effect relationships in the experiment.	1.B.1.a Verify the idea that there is no fixed set of steps all scientists follow, scientific investigations usually involve the collection of relevant evidence, the use of logical reasoning, and the application of imagination in devising hypotheses and explanations to make sense of the collected evidence.	Lesson 1 Scientific Theory and Science in the World
		1.B.1.b Explain that what people expect to observe often affects what they actually do observe and that scientists know about this danger to objectivity and take steps to try to avoid it when designing investigations and examining data.	
		1.B.1.c Explain that even though different explanations are given for the same evidence, it is not always possible to tell which one is correct.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
		1.B.1.d Describe the reasoning that lead to the interpretation of data and conclusions drawn.	
		1.B.1.e Question claims based on vague statements or on statements made by people outside their area of expertise.	
	1.C.1 Develop explanations that explicitly link data from investigations conducted, selected readings and, when appropriate, contributions from historical discoveries.	1.C.1.a Organize and present data in tables and graphs and identify relationships they reveal.	
		1.C.1.b Interpret tables and graphs produced by others and describe in words the relationships they show.	
		1.C.1.c Give examples of how 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.	
	1.C.1.d Criticize the reasoning in arguments in which	1.C.1.d.1 Fact and opinion are intermingled	
		1.C.1.d.2 Conclusions do not follow logically from the evidence given.	
		1.C.1.d.3 Existence of control groups and the relationship to experimental groups is not made obvious.	
		1.C.1.d.4 Samples are too small, biased, or not representative.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
	1.C.1 Develop explanations that explicitly link data from investigations conducted, selected readings and, when appropriate, contributions from historical discoveries.	1.C.1.e Explain how different models can be used to represent the same thing. What kind of a model to use and how complex it should be depend on its purpose. Choosing a useful model is one of the instances in which intuition and creativity come into play in science, mathematics, and engineering	Lesson 2 Systems and Models
		1.C.1.f Participate in group discussions on scientific topics by restating or summarizing accurately what others have said, asking for clarification or elaboration, and expressing alternative positions.	
		1.C.1.g Recognize that important contributions to the advancement of science, mathematics, and technology have been made by different kinds of people, in different cultures, at different times.	
	1.D1.A Explain that complex systems require control mechanisms.	1.D1.A.a Explain that the choice of materials for a job depends on their properties and on how they interact with other materials.	
		1.D1.A.b Demonstrate that all control systems have inputs, outputs, and feedback.	Lesson 2 Systems and Models

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
		1.D1.A.c Realize that design usually requires taking constraints into account. (Some constraints, such as gravity or the properties of the materials to be used, are unavoidable. Other constraints, including economic, political, social, ethical, and aesthetic ones also limit choices.)	
		1.D1.A.d Identify reasons that systems fail they have faulty or poorly matched parts, are used in ways that exceed what was intended by the design, or were poorly designed to begin with.	
	1.D1.B Analyze, design, assemble and troubleshoot complex systems.	1.D1.B.a Provide evidence that a system can include processes as well as things.	
		1.D1.B.b Explain that thinking about things as systems means looking for how every part relates to others. (The output from one part of a system (which can include material, energy, or information) can become the input to other parts. Such feedback can serve to control what goes on in the system as a whole.)	Lesson 2 Systems and Models
		1.D1.B.c Analyze any system to determine its connection, both internally and externally to other systems and explain that a system may be thought of as containing subsystems and as being a subsystem of a larger system.	Lesson 2 Systems and Models

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
	1.D1.C Analyze the value and the limitations of different types of models in explaining real things and processes.	1.D1.C.a Explain that the kind of model to use and how complex it should be depends on its purpose and that it is possible to have different models used to represent the same thing.	Lesson 2 Systems and Models
		1.D1.C.b Explain, using examples that models are often used to think about processes that happen too slowly, too quickly, or on too small a scale to observe directly, or that are too vast to be changed deliberately, or that are potentially dangerous.	Lesson 2 Systems and Models
		1.D1.C.c Explain that models may sometimes mislead by suggesting characteristics that are not really shared with what is being modeled.	
2.0 Students will use scientific skills and processes to explain the chemical and physical interactions (i.e., natural forces and cycles, transfer of energy) of the environment, Earth, and the universe that occur over time.	2.B.1 Explain how sedimentary rock is formed periodically, embedding plant and animal remains and leaving a record of the sequence in which the plants and animals appeared and disappeared.	2.B.1.a Explain how sedimentary rock buried deep enough may be reformed by pressure and heat and these re-formed rock layers may be forced up again (uplift) to become land surface and even mountains.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
		2.B.1.b Cite evidence to confirm that thousands of layers of sedimentary rock reveal the long history of the changing surface of the Earth	
	2.B.1.c Explain why some fossils found in the top layers of sedimentary rock are older then those found beneath in lower layers.	2.B.1.c.1 Folding	
		2.B.1.c.2 Breaking	
		2.B.1.c.3 Uplift	
		2.B.1.c.4 Faulting	
		2.B.1.c.5 Tilting	
	2.B.2 Recognize and explain that fossils found in layers of sedimentary rock provide evidence of changing life forms.	2.B.2.a Recognize how different types of fossils are formed, such as petrified remains, imprints, molds and casts.	
		2.B.2.b Recognize and explain that the fossil record of plants and animals describes changes in life forms over time.	
	2.D.1 Identify and describe the components of the universe.	2.D.1.a Recognize that a galaxy contains billions of stars that cannot be distinguished by the unaided eye because of their great distance from Earth, and that there are billions of galaxies.	Lesson 35 Astronomy
		2.D.1.b Identify that our solar system is a component of the Milky Way Galaxy.	
		2.D.1.c Identify and describe the various types of galaxies	Lesson 35 Astronomy
		2.D.1.d Identify and describe the type, size, and scale, of the Milky Way Galaxy.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
	2.D.2 Identify and explain celestial phenomena using the regular and predictable motion of objects in the solar system.	2.D.2.a Identify and describe the relationships among the period of revolution of a planet, the length of its solar year, and its distance from the sun.	
		2.D.2.b Identify and explain the relationship between the rotation of a planet or moon on its axis and the length of the solar day for that celestial object.	
		2.D.2.c Identify and explain the cause of the phases of the moon.	
		2.D.2.d Describe how lunar and solar eclipses occur.	
		2.D.2.e Identify and describe how the shape and location of the orbits of asteroids and comets affect their periods of revolution.	
	2.D.3 Recognize and explain the effects of the tilt of Earth s axis.	2.D.3.a Recognize and describe that Earth's axis is tilted about 23º from vertical with respect to the plane of its orbit and points in the same direction during the year.	
	2.D.3.b Recognize and describe that as Earth orbits the sun, the tilt of Earth's axis causes	2.D.3.b.1 Changes in the angle of the sun in the sky during the year	
		2.D.3.b.2 Seasonal differences in the northern and southern latitudes	
	2.D.3 Recognize and explain the effects of the tilt of Earth s axis.	2.D.3.c Recognize and describe how the tilt of Earth's axis affects the climate in Maryland.	
	2.D.4 Recognize and explain how the force of gravity causes the tides.	2.D.4.a Identify and describe the cause of high and low tides.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
	2.E.1 Cite evidence to explain the relationship between the hydrosphere and atmosphere.	2.E.1.a Describe the composition of the atmosphere and hydrosphere.	
		2.E.1.b Recognize and describe the water cycle as the distribution and circulation of Earth s water through the glaciers, surface water, groundwater, oceans, and atmosphere.	Lesson 26 The Water Cycle
	2.E.1.c Identify and describe how the temperature and precipitation in a geographic area are affected by surface features and changes in atmospheric and ocean content.	2.E.1.c.1 Relative location of mountains	
		2.E.1.c.2 Volcanic eruptions	
		2.E.1.c.3 Proximity (closeness) to large bodies of water	
		2.E.1.c.4 Heat energy of ocean currents	
	2.E.2.a Identify and describe how the temperature and precipitation of an area are affected by surface and ocean features.	2.E.2.a.1 Relative location of mountains	
		2.E.2.a.2 Proximity (closeness) to large bodies of water	
		2.E.2.a.3 Warm and cold ocean currents	
	2.E.2 Recognize and describe the various factors that affect climate.	2.E.2.b Recognize and describe the global effects of volcanic eruptions, greenhouse gases, and El Nino.	Lesson 30 Climate Change

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
	2.E.3 Identify and describe the atmospheric and hydrospheric conditions related to weather systems.	2.E.3.a Identify and describe weather patterns associated with high and low pressure systems and the four frontal systems using appropriate data displays including weather maps.	
		2.E.3.b Identify and describe the atmospheric and hydrospheric conditions associated with the formation and development of hurricanes, tornadoes, and thunderstorms.	
	2.E.3.c Identify and describe how various tools are used to collect weather data and forecast weather conditions.	2.E.3.c.1 Barometer	
		2.E.3.c.2 Thermometer	
		2.E.3.c.3 Anemometer	
		2.E.3.c.4 Psychrometer	
3.0 The students will use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.	3.D.1 Recognize and describe that evolutionary change in species over time occurs as a result of natural variation in organisms and environmental changes.	3.D.1.a Recognize and describe that gradual (climatic) and sudden (floods and fires) changes in environmental conditions affect the survival of organisms and populations.	Lesson 29 Natural Change on Earth

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
		3.D.1.b Recognize that adaptations may include variations in structures, behaviors, or physiology, such as spiny leaves on a cactus, birdcalls, and antibiotic resistant bacteria.	Lesson 18 Natural selection
		3.D.1.c Recognize and describe that adaptation and speciation involve the selection of natural variations in a population.	Lesson 18 Natural selection
		3.D.1.d Recognize and describe that extinction occurs when the adaptive traits of a population do not support its survival.	
		3.D.1.e Recognize that evolution accounts for the diversity of species.	Lesson 18 Natural selection
4.0 Students will use scientific skills and processes to explain the composition, structure, and interactions of matter in order to support the predictability of structure and energy transformations	4.A.1 Provide evidence to explain how compounds are produced. (No electron transfer)	4.A.1.a Describe how elements form compounds and molecules.	Lesson 4 Elements, Compounds, and Mixtures
		4.A.1.b Investigate and describe what happens to the properties of elements when they react chemically with other elements.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
		4.A.1.c Based on data from investigations and research compare the properties of compounds with those of the elements from which they are made.	Lesson 4 Elements, Compounds, and Mixtures
	4.B.1 Provide evidence to support the fact that the idea of atoms explains conservation of matter.	4.B.1.a Use appropriate tools to gather data and provide evidence that equal volumes of different substances usually have different masses.	
		4.B.1.b Cite evidence from investigations that the total mass of a system remains the same throughout a chemical reaction because the number of atoms of each element remains the same.	
		4.B.1.c Give reasons to justify the statement, If the number of atoms stays the same no matter how the same atoms are rearranged, then their total mass stays the same.	
	4.C.1 Describe how the motion of atoms and molecules in solids, liquids, and gases changes as heat energy is increased or decreased.	4.C.1.a Based on data from investigations and video technology, describe and give reasons for what happens to a sample of matter when heat energy is added to it (most substances expand).	
		4.C.1.b Describe what the temperature of a solid, or a liquid, or a gas reveals about the motion of its atoms and molecules.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
		4.C.1.c Formulate an explanation for the different characterisctics and behaviors of solids, liquids, and gases using an analysis of the data gathered on the motion and arrangement of atoms and molecules.	
	4.D.1 Compare compounds and mixtures based on data from investigations and research.	4.D.1.a Cite evidence from investigations to explain how the components of mixtures can be separated.	
		4.D.1.b Use evidence from data gathered to explain why the components of compounds cannot be separated using physical properties.	
		4.D.1.c Analyze the results of research completed to develop a comparison of compounds and mixtures.	Lesson 4 Elements, Compounds, and Mixtures
	4.D.2.a Based on data from investigations and research, identify and describe chemical properties of common substances.	4.D.2.a.1 Reacts with oxygen (rusting/tarnishing and burning)	
		4.D.2.a.2 Reacts with acids (dissolves metal)	
		4.D.2.a.3 Reacts with bases (forms soap)	
	4.D.2 Cite evidence and give examples of chemical properties of substances.	4.D.2.b Use information gathered from investigations using indicators and the pH scale to classify materials as acidic, basic, or neutral.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
	4.D.3.a Investigate and describe the occurrence of chemical reactions using the following evidence:	4.D.3.a.1 Color change	
		4.D.3.a.2 Formation of a precipitate or gas	
		4.D.3.a.3 Release of heat or light	
	4.D.3.b Use evidence from observations to identify and describe factors that influence reaction rates.	4.D.3.b.1 Change in temperature	
		4.D.3.b.2 Acidity	
	4.D.3 Provide evidence to support the fact that common substances have the ability to change into new substances.	4.D.3.c Identify the reactants and products involved in a chemical reaction given a symbolic equation, a word equation, or a description of the reaction.	Lesson 5 Formulas and Equations
		4.D.3.d Provide data from investigations to support the fact that energy is transformed during chemical reactions.	
		4.D.3.e Provide examples to explain the difference between a physical change and a chemical change.	
5.0 Students will use scientific skills and processes to explain the interactions of matter and energy and the energy transformations that occur.	5.A.1 Develop an explanation of motion using the relationships among time, distance, velocity, and acceleration.	5.A.1.a Observe, describe, and compare the motions of objects using position, speed, velocity, and the direction.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
		5.A.1.b Based on data given or collected, graph and calculate average speed using distance and time.	
		5.A.1.c Compare accelerated and constant motions using time, distance, and velocity.	
		5.A.1.d Describe and calculate acceleration using change in the speed and time.	Lesson 7 Gravity
	5.A.2 Identify and relate formal ideas (Newton s Laws) about the interaction of force and motion to real world experiences.	5.A.2.a Investigate and explain the interaction of force and motion that causes objects that are at rest to move.	Lesson 7 Gravity
		5.A.2.b Demonstrate and explain, through a variety of examples, that moving objects will stay in motion at the same speed and in the same direction unless acted on by an unbalanced force.	Lesson 7 Gravity
		5.A.2.c Investigate and collect data from multiple trials, about the motion that explain the motion that results when the same force acts on objects of different mass; and when different amounts of force act on objects of the same mass.	
		5.A.2.d Based on data collected and organized, explain qualitatively the relationship between net force applied to an object and its mass for a given acceleration.	
		5.A.2.e Calculate the net force given the mass and acceleration.	
	5.A.3.a Explain the difference between mass and weight.	5.A.3.a.1 Mass is a measure of inertia	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
		5.A.3.a.2 Weight is a measure of the force of gravity.	Lesson 7 Gravity
	5.A.3 Recognize and explain that every object exerts gravitational force on every other object.	5.A.3.b Describe the relationship between the gravitational force and the masses of the attracting objects.	Lesson 7 Gravity
		5.A.3.c Describe the relationship between the gravitational force and the distance between the attracting objects.	Lesson 7 Gravity
		5.A.3.d Recognize and cite examples showing that mass remains the same in all locations while weight may vary with a change in location (weight on Earth compared to weight on moon).	
		5.A.3.e Recognize that gravity is the force that holds planets, moons, and satellites in their orbits.	Lesson 7 Gravity
	5.A.4 Recognize and explain that energy can neither be created nor destroyed; rather it changes form or is transferred through the action of forces.	5.A.4.a Observe and describe the relationship between the distance an object is moved by a force and the change in its potential energy or kinetic energy, such as in a slingshot, in mechanical toys, the position of an object and its potential energy..	Lesson 9 Energy Transfer
		5.A.4.b Identify the relationship between the amount of energy transferred (work) to the product of the applied force and the distance moved in the direction of that force.	

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
	5.A.4.c Identify and describe that simple machines (levers and inclined planes) may reduce the amount of effort required to do work.	5.A.4.c.1 Calculate input and output work using force and distance	
		5.A.4.c.2 Demonstrate that input work is always greater than output work	
	5.B.1 Describe and cite evidence that heat can be transferred by conduction, convection and radiation.	5.B.1.a Based on observable phenomena, identify and describe examples of heat being transferred through conduction and through convection.	Lesson 11 Heat Transfer and Review
		5.B.1.b Based on observable phenomena, identify examples to illustrate that radiation does not require matter to transfer heat energy.	Lesson 11 Heat Transfer and Review
		5.B.1.c Research and identify the types of insulators that best reduce heat loss through conduction, convection, or radiation.	
	5.B.2.a Identify and describe the various forms of energy that are transformed in order for systems (living and non-living) to operate.	5.B.2.a.1 Chemical - Flashlight battery-Light	
		5.B.2.a.2 Mechanical Pulleys-Motion	
		5.B.2.a.3 Solar/Radiant - Solar calculator	
		5.B.2.a.4 Chemical - Plant cells	
	5.B.2 Identify and explain that heat energy is a product of the conversion of one form of energy to another.	5.B.2.b Explain that some heat energy is always lost from a system during energy transformations.	Lesson 10 Thermodynamics

Alignment Document
State of Maryland and Aventa Learning

Science 8

Strand	Common Curriculum Goal	Standard	Lesson Name
6.0 Students will use scientific skills and processes to explain the interactions of environmental factors (living and nonliving) and analyze their impact from a local to a global perspective.	6.B.1.a Based on data from research identify and describe how natural processes change the environment.	6.B.1.a.1 Cyclic climate change	Lesson 30 Climate Change
		6.B.1.a.2 Sedimentation in watersheds	
		6.B.1.a.3 Population cycles	
		6.B.1.a.4 Extinction	Lesson 29 Natural Change on Earth
	6.B.1.b Identify and describe how human activities produce changes in natural processes:	6.B.1.b.1 Climate change	Lesson 30 Climate Change
		6.B.1.b.2 Loss of habitat due to construction	Lesson 31 Habitat Destruction and Pollution
		6.B.1.b.3 Hunting and fishing	
		6.B.1.b.4 Introduction of nonnative species	Lesson 32 Introduced Species
		6.B.1.b.5 Cycling of matter	Lesson 26 The Water Cycle Lesson 27 The Nitorgen Cycle Lesson 28 The Carbon Cycle