

8th Grade: Science: Focus on Physical Science

Student Name:

General Standard	Standard Notation	Standard Description	August 2010	September 2010	October 2010	November 2010	December 2010	January 2011	February 2011	March 2011	April 2011	May 2011
1.0 MOTION: The velocity of an object is the rate of change of its position. As a basis for understanding	8.1.a	Position is defined in relation to some choice of a standard reference point and a set of reference directions.										
	8.1.b	Average speed is the total distance traveled divided by the total time elapsed and that the speed of an object along the path traveled can vary.										
	8.1.c	Solve problems involving distance, time, and average speed.										
	8.1.d	The velocity of an object must be described by specifying both the direction and the speed of the object.										
	8.1.e	Changes in velocity may be due to changes in speed, direction, or both.										
	8.1.f	Interpret graphs of position versus time and graphs of speed versus time for motion in a single direction.										
2.0 FORCES: Unbalanced forces cause changes in velocity	8.2.a	A force has both direction and magnitude										
	8.2.b	When an object is subject to two or more forces at once, the result is the cumulative effect of all the forces.										
	8.2.c	When the forces on an object are balanced, the motion of the object does not change.										
	8.2.d	Identify separately the two or more forces that are acting on a single static object, including gravity, elastic forces due to tension or compression in matter, and friction.										
	8.2.e	When the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).										
	8.2.f	The greater the mass of an object, the more force is needed to achieve the same rate of change in motion.										
	8.2.g	The role of gravity in forming & maintaining the shapes of planets, stars, & the solar system										
3.0 STRUCTURE OF MATTER: Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements	8.3.a	The structure of the atom and know it is composed of protons, neutrons, and electrons										
	8.3.b	Compounds are formed by combining two or more different elements and that compounds have properties that are different from their constituent elements.										
	8.3.c	Atoms and molecules form solids by building up repeating patterns, such as the crystal structure of NaCl or long-chain polymers.										
	8.3.d	The states of matter (solid, liquid, gas) depend on molecular motion										
	8.3.e	In solids, atoms are closely locked in position & can only vibrate; in liquids atoms & molecules are more loosely connected & can collide with & move past one another; & in gases the atoms and molecules are free to move independently, colliding frequently										
	8.3.f	Use the periodic table to identify elements in simple compounds.										
4.0 EARTH IN THE SOLAR SYSTEM (EARTH SCIENCE): The structure and composition of the universe can be learned from studying stars and galaxies and their evolution	8.4.a	Galaxies are clusters of billions of stars and may have different shapes.										
	8.4.b	The Sun is one of many stars in the Milky Way galaxy and that stars may differ in size, temperature, and color.										
	8.4.c	Use astron. units and light yrs as measures of distances between the Sun, stars, & Earth										
	8.4.d	Stars are the source of light for all bright objects in outer space and that the Moon and planets shine by reflected sunlight, not by their own light.										

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	8.4.e	The appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, and asteroids.										
5.0 REACTIONS: Chemical reactions are processes in which atoms are rearranged into different combinations of molecules	8.5.a	Reactant atoms and molecules interact to form products with different chemical properties										
	8.5.b	The idea of atoms explains the conservation of matter: In chemical reactions the number of atoms stays the same no matter how they are arranged, so their total mass stays the same										
	8.5.c	Chemical reactions usually liberate heat or absorb heat										
	8.5.d	Physical processes include freezing and boiling, in which a material changes form with no chemical reaction.										
	8.5.e	Determine whether a solution is acidic, basic, or neutral.										
6.0 CHEMISTRY IN LIVING SYSTEMS (LIFE SCIENCE): Principles of chemistry underlie the functioning of biological systems	8.6.a	Carbon, because of its ability to combine in many ways with itself and other elements, has a central role in the chemistry of living organisms.										
	8.6.b	Living organisms are made of molecules consisting largely of carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur.										
	8.6.c	Living organisms have many different kinds of molecules, including small ones, such as water and salt, and very large ones, such as carbohydrates, fats, proteins, and DNA.										
7.0 PERIODIC TABLE: The organization of the periodic table is based on the properties of the elements and reflects the structure of atoms	8.7.a	Identify regions corresponding to metals, nonmetals, and inert gases										
	8.7.b	Each element has a specific number of protons in the nucleus (the atomic number) & each isotope of element has a different but specific number of neutrons in the nucleus										
	8.7.c	Substances can be classified by their properties, including their melting temperature, density, hardness, and thermal and electrical conductivity.										
8.0 DENSITY AND BUOYANCY: All objects experience a buoyant force when immersed in a fluid	8.8.a	Density is mass per unit volume										
	8.8.b	Calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume										
	8.8.c	The buoyant force on an object in a fluid is an upward force equal to the weight of the fluid the object has displaced.										
	8.8.d	Predict whether an object will float or sink										
9.0 INVESTIGATION AND EXPERIMENTATION: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations	8.9.a	Plan and conduct a scientific investigation to test a hypothesis										
	8.9.b	Evaluate the accuracy and reproducibility of data.										
	8.9.c	Distinguish between variable and controlled parameters in a test.										
	8.9.d	Recognize the slope of the linear graph as the constant in the relationship $y=kx$ and apply this principle in interpreting graphs constructed from data										
	8.9.e	Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.										
	8.9.f	Apply simple math relationships to determine a missing quantity in a math expression, given the two remaining terms (including speed = distance/time, density = mass/volume, force = pressure x area, volume = area x height).										
	8.9.g	Distinguish between linear and nonlinear relationships on a graph of data										