

Integrated Science 2011-2012 Benchmark Blueprint

Green Dot Public Schools

Assessments

Waves		1	2	3	4
4.0	Students know waves have characteristic properties that do not depend on the type of wave. As a basis for understanding this concept:				
4.a	Students know waves carry energy from one place to another.	3			
4.b	Students know how to identify transverse and longitudinal waves in mechanical media such as springs, ropes, and the Earth (seismic waves).	3			
4.d	Students know sound is a longitudinal wave whose speed depends on the properties of the medium in which it propagates.	3			
4.e	Students know radio waves, light and X-rays are different wavelength bands in the spectrum of electromagnetic waves whose speed in vacuum is approximately 3×10^8 m/s (186,000 miles/second).	3			
4.f	Students know how to identify the characteristic properties of waves: interference (beats), diffraction, refraction, Doppler effect, and polarization.	3			
Electric and Magnetic Phenomena					
5.0	Students know electric and magnetic phenomena are related and have many practical applications. As a basis for understanding this concept:				
5.d	Students know the properties of transistors and their role in electric circuits.	3			
5.e	Students know charged particles are sources of electric fields and experience forces due to the electric fields from other charges.	3			
5.h	Students know changing magnetic fields produce electric fields, thereby inducing currents in nearby conductors.	3			
5.i	Students know plasmas, the fourth state of matter, contain ions and/or free electrons and conduct electricity.	3			
Atomic and Molecular Structure					
1.0	Students know the periodic table displays the elements in increasing atomic number and shows how periodicity of the physical and chemical properties of the elements relates to atomic structure. As a basis for understanding this concept:				
1.a	Students know how to relate the position of an element in the Periodic Table to its atomic number and atomic mass.		4		
1.b	Students know how to use the Periodic Table to identify metals, semimetals, nonmetals, and halogens.		4		

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Atomic and Molecular Structure		1	2	3	4
1.c	Students know how to use the Periodic Table to identify alkali metals, alkaline earth metals and transition metals, and trends in ionization energy, electronegativity, and the relative sizes of ions and atoms.		4		
1.d	Students know how to use the Periodic Table to determine the number of electrons available for bonding.		4		
Chemical Bonds					
2.0	Students know biological, chemical, and physical properties of matter result from the ability of atoms to form bonds from electrostatic forces between electrons and protons and between atoms and molecules. As a basis for understanding this concept:				
2.a	Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds, or by exchanging electrons to form ionic bonds.		4		
2.b	Students know chemical bonds between atoms in molecules such as H ₂ , CH ₄ , NH ₃ , H ₂ CCH ₂ , N ₂ , C ₁₂ , and many large biological molecules are covalent.		4		
Acids and Bases					
5.0	Students know acids, bases, and salts are three classes of compounds that form ions in water solutions. As a basis for understanding this concept:				
5.a	Students know the observable properties of acids, bases and salt solutions.		4		
Chemical Thermodynamics					
7.0	Students know energy is exchanged or transformed in all chemical reactions and physical changes of matter. As a basis for understanding this concept:				
7.b	Students know chemical processes can either release (exothermic) or absorb (endothermic) thermal energy.		4		
Ecology					
6.0	Students know stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:				
6.b	Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.			5	
6.d	Students know how water, carbon, and nitrogen cycle between abiotic resources and organic matter in the ecosystem and how oxygen cycles via photosynthesis and respiration.			8	



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6.f	Students know at each link in a food web, some energy is stored in newly made structures but much is dissipated into the environment as heat and this can be represented in a food pyramid.			5	
Evolution		1	2	3	4
8.0	Students know evolution is the result of genetic changes that occur in constantly changing environments. As a basis for understanding this concept:				
8.a	Students know how natural selection determines the differential survival of groups of organisms.			8	
8.b	Students know a great diversity of species increases the chance that at least some organisms survive large changes in the environment.			5	
8.e	Students know how to analyze fossil evidence with regard to biological diversity, episodic speciation, and mass extinction.			5	
Dynamic Earth Processes		1	2	3	4
3.0	Students know plate tectonics operating over geologic time has changed the patterns of land, sea, and mountains on Earth's surface. As the basis for understanding this concept:				
3.b	Students know the principal structures that form at the three different kinds of plate boundaries.				4
3.c	Students know how to explain the properties of rocks based on the physical and chemical conditions in which they formed, including plate tectonic processes.				4
3.d	Students know why and how earthquakes occur, and the scales used to measure their intensity and magnitude.				4
3.e	Students know two kinds of volcanoes, one with violent eruptions producing steep slopes and the other with voluminous lava flows producing gentle slopes.				4
Biogeochemical Cycles		1	2	3	4
7.0	Students know each element on Earth moves among reservoirs, which exist in the solid earth, in oceans, in the atmosphere, and within and among organisms as part of biogeochemical cycles. As a basis for understanding this concept:				
7.a	Students know the carbon cycle of photosynthesis and respiration, and the nitrogen cycle.				4
7.b	Students know the global carbon cycle in terms of the different physical and chemical forms of carbon in the atmosphere, oceans, biomass, and fossil fuels, and the movement of carbon among these reservoirs.				4



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California Geology		1	2	3	4
9.0	Students know the geology of California underlies the state's wealth of natural resources as well as its natural hazards. As a basis for understanding this concept:				
9.a	Students know the resources of major economic importance in California and their relation to California's geology.				3
9.b	Students know the principal natural hazards in different California regions, and the geological basis of those hazards.				3
Total Number of Items		27	32	36	30