



California Science Content Standards related to Nanoscience & Nanotechnology

3	4	5	6	7	8	Physics	Chemistry	Biology
1h		1b 1c 1e		6a 6d	3c 3e	3c 4e 4f 5d 5f	2c 8b	1a
		6g		7d		Investigation & Experimentation		
						1g	1i	



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3	4	5	6	7	8	Physics	Chemistry	Biology
<p>1h - Students know all matter is made of small particles called atoms, too small to see with the naked eye.</p>		<p>1b - Students know all matter is made of atoms, which may combine to form molecules.</p> <p>1c - Students know metals have properties in common, such as high electrical and thermal conductivity. Some metals, such as aluminum (Al), iron (Fe), nickel (Ni), copper (Cu), silver (Ag), and gold (Au), are pure elements; others, such as steel and brass, are composed of a combination of elements.</p> <p>1e - Students know scientists have developed instruments that can create discrete images of atoms and molecules that show that the atoms and molecules often occur in well-ordered arrays.</p>		<p>6a - Students know visible light is a small band within a very broad electromagnetic spectrum.</p> <p>6d - Students know how simple lenses are used in a magnifying glass, the eye, a camera, a telescope, and a microscope.</p>	<p>3c - Students know atoms and molecules form solids by building up repeating patterns, such as the crystal structure of NaCl or long-chain polymers.</p> <p>3e - Students know that in solids the atoms are closely locked in position and can only vibrate; in liquids the atoms and molecules are more loosely connected and can collide with and move past one another; and in gases the atoms and molecules are free to move independently, colliding frequently.</p>	<p>2c - Students know the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. The greater the temperature of the object, the greater the energy of motion of the atoms and molecules that make up the object.</p> <p>4e - Students know radio waves, light, and X-rays are different wavelength bands in the spectrum of electromagnetic waves whose speed in a vacuum is approximately 3×10^8 m/s (186,000 miles/second).</p> <p>4f - Students know how to identify the characteristic properties of waves: interference (beats), diffraction, refraction, Doppler effect, and polarization.</p> <p>5d - Students know the properties of transistors and the role of transistors in electric circuits.</p> <p>5f - Students know magnetic materials and electric currents (moving electric charges) are sources of magnetic fields and are subject to forces arising from the magnetic fields of other sources.</p>	<p>2c - Students know salt crystals, such as NaCl, are repeating patterns of positive and negative ions held together by electrostatic attraction.</p> <p>8b - Students know how reaction rates depend on such factors as concentration, temperature, and pressure.</p>	<p>1a - Students know cells are enclosed within semipermeable membranes that regulate their interaction with their surroundings.</p>
		<p>6g - Students know how to record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.</p>		<p>7d - Students know how to construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).</p>		<h3>Investigation & Experimentation</h3>		
						<p>1g - Students know how to recognize the usefulness and limitations of models and theories as scientific representations of reality.</p>	<p>1i - Students know how to analyze the locations, sequences, or time intervals that are characteristic of natural phenomena (e.g., relative ages of rocks, locations of planets over time, and succession of species in an ecosystem).</p>	