

**LOS ANGELES UNIFIED
SCHOOL DISTRICT**

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**Summer School
Instructional Guide**

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Secondary
Science
Grades 6 - 12

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Division of Secondary Instruction
Secondary Science Branch
Revised 2011



Science

Summer School Curriculum Information

Overview

Science courses to be offered in summer school:

6th Grade Science, 7th Grade Science, 8th Grade Science, ICS 1, Biology, Chemistry

Curricular Guideline is provided by

- Science Framework for California Public Schools: Kindergarten Through Grade 12* (<http://www.cde.ca.gov/ci/cr/cf/documents/scienceframework.pdf>)
- CST Blueprints (<http://www.cde.ca.gov/ta/tg/sr/blueprints.asp>) for grade 8 and High School Science Courses
- LAUSD Science Instructional Guides, which provide a loose pacing plan with a conceptual flow of the mandated standards in each subject/grade level. (http://science-laUSD.net/apps/pages/index.jsp?uREC_ID=46481&type=d&rn=4489724)
- Textbooks are used as a resource.

Considerations:

- Investigations and Experimentation Standards (I&E standards) should be incorporated into the instruction through laboratory and hands-on experiences- I&E standards are not referenced in this document.
- Model Lessons and Immersion Units were written and implemented by LAUSD to help students learn certain concepts more effectively. If you want to use these resources as a guide, you can download them (<http://science-laUSD.net> **tab “Instructional Materials”**) Standard(s) for which a Model Lesson has been developed will be denoted with an *asterisk*.
- The tables on the following pages show the suggested sequence and pacing of scientific concepts.
- The “Key Concepts” can be found in the Science Instructional Guides. They are the result of collaborative interpretation of the *Framework*.

Grade 6 Science A

Topic/ Concept ("Key Concepts" excerpted from Instructional Guide Section 5)	Standards (<i>Framework</i> pages 84-102)	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
<i>Key Concept:</i> The Model of the Earth's structure reflects the dynamic changes occurring on the surface	1a, 1c, 1e, 1b, 3c, 4c	9 weeks	20 hours
<i>Key Concept:</i> Earthquakes occur and volcanoes erupt because of factors below Earth's Surface	1d, 1f, 3a, 1g, 2d		
<i>Key Concept:</i> The dynamic systems on Earth are affected by the Sun's energy	4a, 4b, 4d, 4e, 3a, 3d	9 weeks	20 hours
<i>Key Concept:</i> Human populations are affected by flooding, earthquakes, and volcanoes	2a, 2b, 2c, 2d		

Grade 6 Science B

Topic/ Concept ("Key Concepts" excerpted from Instructional Guide Section 5)	Standards (<i>Framework</i> pages 84-102)	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
<i>Key Concept:</i> Energy and matter are exchanged in an ecosystem	5a, 5b, 5c, 5d, 5e	9 weeks	20 hours
<i>Key Concept:</i> Renewable and nonrenewable resources are important to the economy of California	6a, 6b, 6c, 2d, 3b		

* Health should be covered for the balance of this course, which equals 20 hours.

Grade 7 Science (ONE Semester Course)

Topic/ Concept ("Key Concepts" excerpted from Instructional Guide Section 7)	Standards (<i>Framework</i> pages 103-124)	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
<i>Key Concept:</i> The properties of light explain how images are perceived as light moves through	6a, 6c, 6d, 6f, 6g	9 weeks	19 hours
<i>Key Concept:</i> The development of lenses and microscopes led to the discovery of cells and their functions	6d, 1a, 1b, 1c, 1f		
<i>Key Concept:</i> Chloroplasts capture solar energy in the form of glucose that is used by mitochondria to liberate energy for the work that cells do	1d		
<i>Key Concept:</i> The process of mitosis passes DNA, the genetic material, to every new cell in an organism	1e, 2e		
<i>Key Concept:</i> Sexual reproduction in human requires the combination of an egg and a sperm	5d, 5e, 2b		
<i>Key Concept:</i> There are two types of reproduction in multicellular organisms	2a, 5f, 2b		
<i>Key Concept:</i> Inherited traits are determined by genes	2c, 2d		
<i>Key Concept:</i> Living things have levels of organization that are specific, yet all levels work together in that living thing	5a, 5b	10 weeks	21 hours
<i>Key Concept:</i> The eye and the ear have specific structures which function in specific ways so sight and hearing are possible	5g, 6e, 6b		
<i>Key Concept:</i> Muscles, bones and joints work in specific ways so movement is possible	6h, 5c, 6i		
<i>Key Concept:</i> The heart's contractions pump blood that flows one way because of the heart valves preventing backflow.	6j		
<i>Key Concept:</i> Diversity, evolution and extinction are caused by genetic variation, environmental and geographic factors	3a, 3e, 3b, 4f		
<i>Key Concept:</i> Fossils are a significant factor in determining the geological time scale and can also indicate how life and environmental conditions have changed over time	4e, 4g, 4b		
<i>Key Concept:</i> The major factors that are used to determine Earth's history are radioactive dating, geological layers, and fossils	4c, 4a, 4d, 3c, 3d		

Grade 8 Science A

Topic/ Concept ("Key Concepts" excerpted from Instructional Guide Section 9)	Standards (<i>Framework</i> pages 125-151)	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
Motion of a body traveling either at a constant speed or with a varying speed that is represented by an average value. (<i>Framework, p.125</i>)	1a, 1b, 1c, 1d, 1e, 1f	13 weeks	27 hours
Balanced forces keep an object from changing its velocity and changes in velocities of objects are caused by unbalanced forces (<i>Framework, p.129</i>)	2a, 2b, 2c, 2d, 2e, 2f		
Will an object sink or float? Understanding density and buoyancy helps in predicting the outcome (<i>Framework, p.147</i>)	8a, 8b, 8c		
<i>Key Concept:</i> States of matter are dependent upon molecular motion and compactness of particles, and changes of state are not chemical changes	3d, 3e, 5d	12 weeks	13 hours
<i>Key Concept:</i> Elements can be classified by their properties, and the Periodic Table is a way to identify and group elements by their properties	3f, 7a, 7c		
<i>Key Concept:</i> Atoms of an element have a specific number of protons (the atomic number), and electrons, and occur as isotopes, with different but specific numbers of neutrons	3a, 7b		

Grade 8 Science B

Topic/ Concept ("Key Concepts" excerpted from Instructional Guide Section 9)	Standards (<i>Framework</i> pages 125-151)	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
<i>Key Concept:</i> Crystals and polymers form solids by repeating patterns of atoms or molecules	3c	6 weeks	13 hours
<i>Key Concept:</i> when elements combine to form new compounds with different properties are formed, no mass is lost or gained	3b, 5b, 5a		
<i>Key Concept:</i> Chemical reactions liberate or absorb heat	5c		
<i>Key Concept:</i> Solutions can be identified as acidic, basic, or neutral, using pH indicators and electronic pH meters	5e		
Chemical reactions take place continually in plants and animals, including humans (<i>Framework, p.143</i>)	6a, 6b, 6c	13 weeks	27 hours
<i>Key Concept:</i> Objects in the Solar System have a wide variety of characteristics, have shapes and motion influenced by gravity, and have distinctive units for distance measurement	2g, 4e, 4c		
<i>Key Concept:</i> Stars produce light that planets reflect, vary in size, color and temperature and are grouped into galaxies of differing shapes	4d, 4b, 4a		

ICS 1 A

Topics	Standards	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
Earth Science <input type="checkbox"/> Dynamic Earth's process (plate tectonics) <input type="checkbox"/> Biogeochemical Cycles <input type="checkbox"/> California Geology	<i>Framework pp.251-279</i> 3a, 3b, 3c, 3d, 3e, 3f 7a, 7b, 7c, 7d 9b, 9c, 9d	10 weeks	32 hours
Physics <input type="checkbox"/> Entropy <input type="checkbox"/> Waves <input type="checkbox"/> Electric and Magnetic Phenomena	<i>Framework pp.156-184, 278-279</i> 3f 4a, 4b, 4d, 4e, 4f 5d, 5e, 5h, 5i, 5j, 5m	9 weeks	28 hours

ICS 1 B

Topics	Standards	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
Chemistry <input type="checkbox"/> Atomic and Molecular Structure <input type="checkbox"/> Chemical Bonds <input type="checkbox"/> Acids and Bases <input type="checkbox"/> Chemical Thermodynamics	<i>Framework pp.185-219, 278-279</i> 1a, 1b, 1c, 1d, 1e, 1f 2a, 2b, 2c 5a, 5c 7b, 7c	10 weeks	32 hours
Biology <input type="checkbox"/> Ecology <input type="checkbox"/> Evolution	<i>Framework pp.220-250, 278-279</i> 6a, 6b, 6c, 6d, 6e, 6f, 6g 8a, 8b, 8e	9 weeks	28 hours

Textbook: *Integrated Coordinated Science for the 21st Century*

Biology A

Topics	Standards <i>Framework pp. 220-250, 278-279</i>	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
Macromolecules	1b, 1h, 4e, 4f	13 weeks	41 hours
Cellular Structure	1a, 1c, 1e, 1j		
Cellular Energy	1f, 1g, 1i		
Central Dogma	1d, 4a, 4b, 4c, 5a, 5b, 7c		
DNA Technology	4d, 5c, 5d, 5e	6 weeks	19 hours
Gamete Formation and Fertilization	2b, 2d,, 2e, 2f		
Meiosis and Mendel's Law	2a, 2c, 3b, 3d		
Probability of Inheritance	2g, 3a, 3c		

Textbooks:

Publisher	Author(s)	ISBN
Holt Reinhart Winston	Johnson, Raven	0-03-092201-1
McDougal Littell	Nowiki	9780618725106
Pearson Prentice Hall	Miller, Levine	0-13-201352-5

Biology B

Topics	Standards <i>Framework pp. 220-250, 278-279</i>	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
Natural Selective	6g, 7a, 7c, 7d, 8a, 8b	6 weeks	19 hours
Population Genetics	7b, 7e, 7f		
Mechanism for Evolution	8c, 8d		
Evidence for Evolution	8e, 8f, 8g		
Gas and Nutrient Exchange	9a, 9f, 9g, 9i	13 weeks	41 hours
Electrochemical Communication and Response	9b, 9d, 9e, 9h		
Feedback Mechanism	9c, 9i		
Infection/Immunity	10a, 10b, 10c, 10d, 10e, 10f		
Ecology	6a, 6b, 6c, 6d, 6e, 6f		

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Chemistry A

Topics	Standards <i>Framework pp. 185-219, 278-279</i>	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
The Periodic Table	1b, 1f, 1c	13 weeks	41 hours
Atomic Structure	1h, 1i, 1j, 1e, 1a, 1g		
Periodicity and Electron Arrangement	1a, 1g, 1d		
Chemical Bonding	2e, 2a, 1c, 2b, 2c, 2d, 2h, 2f		
Mole concept	3b, 3c, 3a		
Stoichiometry	3d, 3e, 3f, 3g	6 weeks	19 hours
Kinetic Motion of Gases	4a, 4b, 4e, 4f, 4g		
The Gas Laws	4c, 3d, 4d, 4h, 4i		
Solutions	6a, 6b, 6d, 6e, 6f		

Textbooks:

Publisher	Author(s)	ISBN
Glencoe		0-07-877237-0
Holt Reinhart Winston	Myers, Oldham, Tocci	0-03-092204-6
McDougal Littell	Zumdahl, Zumdahl	9780618562763

Chemistry B

Topics	Standards <i>Framework pp. 185-219, 278-279</i>	Suggested approximate time for instruction during the school year	Suggested approximate time for instruction in summer sessions
Chemical Equilibrium	9a, 9b, 6c, 9c	6 weeks	19 hours
Acids and Bases	5a, 5b, 5e		
Acid/Base Equilibrium	5b, 5c, 9a, 9b, 9c, 5f, 5g		
Chemical Thermodynamics	7a, 7c, 7d, 7b, 7e, 7f, 8a, 8b, 8d, 8c	13 weeks	41 hours
Organic Chemistry	10b, 10d, 10e, 10a, 10c, 10f		
Nuclear Chemistry	11a, 11c, 11d, 11e, 11f		
Nuclear Energy	11b		
Particle Physics	11g		

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