

# FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



## Integrated Science 7

<b>Board Approval Date:</b>	<b>Course Length: 3 Trimesters</b>
<b>Grading: A-F</b>	<b>Credits: N/A</b>
<b>Proposed Grade Level(s): 7</b>	<b>Subject Area: Science</b> <b>Elective Area (if applicable):</b>
<b>Prerequisite(s):</b> <b>Seventh grade standing</b>	<b>Corequisite(s):</b> <b>N/A</b>
<b>CTE Sector/Pathway: N/A</b>	
<b>Intent to Pursue 'A-G' College Prep Status: No</b>	
<b>A-G Course Identifier: N/A</b>	
<b>Graduation Requirement: No</b>	
<b>Course Intent:</b> <b>Program (if applicable): N/A</b>	

### COURSE DESCRIPTION:

This is the second of three courses in the preferred integrated model for science instruction in grades six through eight. In this course, students will have the opportunity to engage in real-world phenomena, ask questions, and seek answers to those questions without regard to disciplinary boundaries. Each unit in this course opens with an integrated phenomena that unites all the interdisciplinary sub-units to address a real-world event through an anchoring phenomena. Each anchoring phenomena is explored in more detail through investigative phenomena. The investigative opportunities provide the schema for students to develop an understanding of the disciplinary core ideas, science and engineering principles and cross-cutting concepts. As a result, students are able to build a deeper, personal connection to the idea or concept being explored.

**DETAILED UNITS OF INSTRUCTION:**

<b>Unit Number/Title</b>	<b>Unit Essential Questions</b>	<b>Examples of Formative Assessments</b>	<b>Examples of Summative Assessment</b>
<b>1. The Composition of Matter</b>	<p>What is matter?</p> <p>What are elements and atoms?</p> <p>What is the difference between matter, an element, and atoms?</p> <p>How are atoms combined to form different structures?</p> <p>Can the same atoms be used in many different combinations?</p> <p>What is the structure of Mesitylene in coal?</p> <p>What properties can be used to identify a substance?</p> <p>What substances are mixed in wood?</p>	<p>*KWL chart on anchoring phenomena</p> <p>*Observing phenomena activity</p> <p>*Investigation: Identifying matter</p> <p>*Investigation: Exploring the atomic scale</p> <p>*Investigation: Creating a periodic table</p> <p>*Making sense of phenomena questions</p> <p>*Investigation: Modeling molecules</p> <p>*Investigation: Investigating density</p> <p>*Investigation: Investigating solubility</p> <p>*Investigation: Identifying an unknown substance</p>	<p>*Performance assessment: Students will identify the best material to work as the base for a makeup pen and write a sales pitch explaining their results.</p>
<b>2. Energy and Matter in Ecosystems</b>	<p>How is carbon a part of plants that would be in a swamp?</p> <p>What is a fuel?</p> <p>Where do consumers get the matter that makes up their cells?</p> <p>Would these cells be full of carbon?</p> <p>What are decomposers?</p> <p>What would happen to dead organisms and wastes if decomposers didn't eat them?</p> <p>What is the only way besides decomposers to release matter back to the cycles of an ecosystem?</p> <p>How does carbon from dead organism form fossil fuels?</p>	<p>*KWL chart on anchoring phenomena</p> <p>*Observing phenomena activity</p> <p>*Investigation: Visualizing photosynthesis</p> <p>*Investigation: Performing photosynthesis</p> <p>*Making sense of phenomena</p> <p>*Investigation: Visualizing cellular respiration</p> <p>*Investigation: Performing cellular respiration</p> <p>*Investigation: Comparing the paths of matter and energy</p> <p>*Investigation: Applying a trophic pyramid model</p> <p>*Investigation: Comparing open and closed systems</p> <p>*Investigation: Predicting matter's global pathways</p>	<p>*Performance assessment: Design an animation that will trace the global pathways taken by carbon through a forest.</p>

<b>3. Earth Processes Through Geologic Time</b>	What is the law of superposition? Why would layers of coal that are millions of years old be found deep under many layers of rock? How do we know whether plants were abundant on Earth millions of years ago?	*KWL chart on anchoring phenomena *Observing phenomena activity *Investigation: Layers of rock *Investigation: Patterns in shapes of rocks *Investigation: Index fossils *Making sense of phenomena *Investigation: "Earth Detectives, 'Who stole the triceratop's egg?'" *Investigation: "Earth Detectives and the Mystery Epoch"	*Performance assessment: Students will compose a letter to address and explain questions received regarding the geology of an area around Black Hills.
<b>4. Earth Systems</b>	How does sunlight reach the Earth? How and where do clouds form? How is solar energy first introduced to the biosphere? What is weathering? How could a plant's growing roots cause weathering?	*KWL on anchoring phenomena *Investigation: What are Earth's systems? *Investigation: Observing energy move matter *Investigation: Identifying the size and rate of Earth's processes *Investigation: Scales of change during crystallization	*Performance assessment: Students will design a kiosk for a visitors center in Kilauea, Hawaii that explains how the local volcano changes Earth's surface.
<b>5. Chemical Reactions</b>	What happens in a chemical reaction? What causes a chemical reaction to begin? What happens to the atoms of reactants in a chemical reaction? What happens to the atoms in carbon dioxide during photosynthesis? How is an exothermic reaction different than an endothermic reaction? Where does the energy come from for endothermic reactions? What kind of reaction is photosynthesis? Where does the energy for	*KWL on anchoring phenomena *Investigation: Identifying properties that change in chemical reactions *Making sense of phenomena questions *Observing phenomena activity *Investigation: Modeling chemical reactions *Investigation: Measuring the mass of chemical reactions *Investigation: Modeling energy in chemical reactions *Investigation: Measuring temperature changes in chemical reactions *Investigation: Evaluating	*Engineering Challenge: Designing a hot pack. *Performance assessment: As a prospective candidate for a survivalist show, students will explain how packs and butane torches release heat when they are activated as a way of qualifying for the show.

	<p>photosynthesis come from?</p> <p>What is a natural resource?</p> <p>What does wood come from?</p> <p>What molecule in corn holds energy that can be used for fuel in its chemical bonds?</p> <p>What atoms make up this molecule?</p>	<p>sources of information on synthetic materials</p> <p>*Investigation: Conducting responsible research on synthetic materials</p>	
<b>6. Processes that Shape the Earth</b>	<p>What patterns do scientists see across landforms on Planet Earth that support the idea that the continents have moved around?</p> <p>How does this explain similarities between distant continents?</p> <p>What factors influence the types of rock found at different places around the Earth?</p> <p>How does rock break down into sand?</p> <p>Do you think the rocks making up the Earth's surface in national parks change over time?</p> <p>How does water change state as it cycles?</p> <p>What influences how much water is found in different national parks?</p> <p>What influences the amount of freshwater, soil, or plant life found in an area?</p> <p>How does the amount of resources compare between different national parks found in different areas?</p>	<p>*KWL on anchoring phenomena</p> <p>*Claim-evidence-reasoning on integrated phenomena</p> <p>*Investigation: Collecting evidence to support the continental drift hypothesis</p> <p>*Investigation: Exploring how plate tectonic theory works</p> <p>*Making sense of phenomena questions</p> <p>*Investigation: Exploring the ways rocks form</p> <p>*Investigation: Identifying the three types of rocks</p> <p>*Investigation: Modeling the rock cycle</p> <p>*Investigation: Understanding how energy and gravity drive the movement of water</p> <p>*Investigation: Building a model of the water cycle</p> <p>*Simulation: The basics of states of matter</p> <p>*Investigation: Resource roundup</p> <p>*Investigation: Analyzing the game</p> <p>*Investigation: Modeling resource use</p>	<p>*Engineering challenge: Students will test and improve a solar distiller using their knowledge of the water cycle.</p> <p>*Performance assessment: As a member on the Board of Natural Resources, students will evaluate the natural resources needs of companies to decide which company will move into the local area.</p>
<b>7. Resources in Ecosystems</b>	<p>What resources do living things need?</p> <p>What determines which species can live in an area</p>	<p>*KWL on anchoring phenomena</p> <p>*Investigation: How resources impact organisms</p>	<p>*Performance assessment: Students will determine what is necessary to support</p>

	<p>like a national park?</p> <p>When is a living thing itself a resource that can impact the distribution of other living things?</p> <p>What causes change in an ecosystem's resources?</p> <p>How does this impact living things?</p> <p>What causes change in an ecosystem's resources?</p> <p>How does this impact living things?</p>	<p>*Investigation: How resources impact populations</p> <p>*Investigation: How resource needs shape ecosystems</p> <p>*Investigation: Making a model ecosystem</p> <p>*Making sense of phenomena questions</p> <p>*Investigation: Finding patterns in predation</p> <p>*Investigation: Classifying the interactions of living things</p> <p>*Observing phenomena activity</p> <p>*Investigation: Tracking how changes impact populations</p> <p>*Investigation: Predicting ecosystem changes</p>	<p>unhealthy cichlids and make them healthy again.</p>
<b>8. States of Matter</b>	<p>How does temperature affect the state of matter?</p> <p>How does temperature affect water?</p> <p>What causes an object to melt or evaporate?</p>	<p>*KWL on anchoring phenomena</p> <p>*Investigation: Modeling states of matter</p> <p>*Investigation: Predicting states of matter</p> <p>*Making sense of phenomena questions</p> <p>*Investigation: Comparing heat, temperature, and thermal energy</p> <p>*Investigation: Gaining and losing thermal energy</p>	<p>*Performance assessment: Students will compose a letter to their extraterrestrial pen pal about preparing for a visit to Earth.</p> <p>*Students will explain the states of matter using the motion of particles and how thermal energy affects the state of matter.</p>
<b>9. Earth's Natural Hazard</b>	<p>What causes an earthquake?</p> <p>What is the impact of earthquakes?</p> <p>How was an earthquake involved in the formation of Quake Lake?</p> <p>What is mass wasting and what causes it?</p> <p>What would happen if a huge landslide dumped rock and soil into a narrow river at a shallow point?</p>	<p>*KWL on anchoring phenomena</p> <p>*Observing phenomena activity</p> <p>*Investigation: Locations of volcanoes and earthquakes around the globe</p> <p>*Investigation: The geo bulletin for forecasting earthquake and volcano risk</p> <p>*Investigation: Designing earthquake-resistant bridges</p> <p>*Making sense of phenomena</p>	<p>*Engineering challenge: Designing a bridge for floods and landslides.</p> <p>*Performance assessment: Students will analyze and interpret data on natural hazards to generate design criteria for three bridges in Placerville, CA.</p>

		<p>questions</p> <p>*Investigation: Causes of mass wasting and floods</p> <p>*Investigation: Causes of tsunamis</p>	
<b>9. Humans and Ecosystems</b>	<p>How can the loss of even one species impact an ecosystem?</p> <p>If the invertebrates in a river die when it becomes a lake, how could this impact the ecosystem?</p> <p>How can an ecosystem provide services to people?</p> <p>Since blocking the Colorado River with the Hoover Dam, what are the negative consequences for people?</p> <p>What are the ways that we depend on freshwater as a resource?</p> <p>How would an increase in the nearby human population impact the Colorado River?</p> <p>How can people solve an ecosystem's health problems?</p>	<p>*KWL on anchoring phenomena</p> <p>*Observing phenomena activity</p> <p>*Investigation: Assessing ecosystem health</p> <p>*Investigation: Changes in biodiversity</p> <p>*Investigation: Calculating the value of ecosystem services</p> <p>*Investigation: Maintaining ecosystem services</p> <p>*Making sense of phenomena questions</p> <p>*Investigation: Population growth and resource use</p> <p>*Investigation: Maintaining biodiversity and ecosystem services</p>	<p>*Engineering challenge: Students will design a fish net that will help preserve biodiversity by targeting certain species rather than all species.</p> <p>*Performance assessment: As a TV reporter, students will research a local story about human population growth has impacted resources.</p>

### **ESSENTIAL STANDARDS:**

MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. (ELA/Literacy CCSS: RST.6-8.1, RST.6-8.2, WHST.6-8.2, WHST.6-8.9 and Math CCSS: 6.EE.C.9)

MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. (ELA/Literacy CCSS: RST.6-8.1, WHST.6-8.2, WHST.6-8.9, SL.8.1, SL.8.4 and Math CCSS: 6.SP.B.5)

MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. (ELA/Literacy CCSS: RST.6-8.1, RI.8.8, WHST.6-8.1, WHST.6-8.9)

MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. (ELA/Literacy CCSS: RST.6-8.1, WHST.6-8.2, SL.8.5 and Math CCSS: MP.2, 6.EE.B.6, 7.EE.B.4)

MS-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor

structures to provide evidence of the past plate motions. (ELA/Literacy CCSS: RST.6-8.1, RST.6-8.7, RST.6-8.9 and Math CCSS: MP.2, 6.EE.B.6, 7.EE.B.4)

MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. (ELA/Literacy CCSS: RST.6-8.7 and Math CCSS: MP.2, MP.4, 6.RP.A.3, 8.EE.A.3)

MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. (ELA/Literacy CCSS: RST.6-8.1, RST.6-8.7 and Math CCSS: MP.2, 6.RP.A.3, 6.SP.B.4, 6.SP.B.5)

MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. (ELA/Literacy CCSS: RST.6-8.7 and Math CCSS: MP.2, MP.4, 6.RP.A.3)

## **RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:**

### **Link to Common Core Standards (if applicable):**

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

<http://www.corestandards.org/ELA-Literacy/RST/6-8/>

### **Link to Framework (if applicable):**

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

<https://www.cde.ca.gov/ci/sc/cf/documents/scifwchapter5.pdf>

### **Link to Subject Area Content Standards (if applicable):**

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

<https://www.cde.ca.gov/pd/ca/sc/documents/cangss-gr7-intdci-3-2015.doc>

### **Link to Program Content Area Standards (if applicable):**

Program Content Area Standards applies to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

## **TEXTBOOKS AND RESOURCE MATERIALS:**

### **Textbooks**

<b>Board Approved</b>	<b>Pilot Completion Date (If applicable)</b>	<b>Textbook Title</b>	<b>Author(s)</b>	<b>Publisher</b>	<b>Edition</b>	<b>Date</b>
<i>Yes</i>		<i>Bring Science Alive! 7th Grade Integrated</i>	Martin, S., L. Blumenthal, S. Duren, R. Mikulec, L. Prescott, M. Wetterschneider	TCI		

## **Other Resource Materials**

### **Supplemental Materials**

Board approved supplemental materials (Including but not limited to: Film Clips, Digital Resources, Supplemental texts, DVDs, programs).

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