CHECKLIST OF CA SCIENCE STANDARDS FOR GRADE 5
MIXTURES AND SOLUTIONS

PURPOSE

The checklist is

- A sequential listing of instructional activities through each module.
- A place to document teaching and coverage of CA standards.
- A correlation tool showing where each CA standard is addressed.

Instructional sequence. The Checklist displays the sequence of instruction as the module progresses through 1) active investigation, 2) reading, and 3) assessment. The chart is broken out by investigation, part, and session number.

Most sessions start with active investigation, which may include teacher demonstration, hands-on activity, recording/writing in notebooks, class discussion, teacher explanation, and vocabulary reinforcement. Next students read, answer review questions, and discuss the reading. Finally, embedded assessments are completed, reviewed, and self-assessed. FOSS Teacher Guide and *Science Resources* book pages where CA standards are addressed are referenced through the instructional sequence.

Documentation of teaching and coverage. The Checklist helps teachers keep track of the class's progress through the module. Teachers can copy the Checklist and record the date of each instruction session. The completed Checklist can serve as a planning tool for teaching the module a second time.

Correlation with CA standards. The Checklist allows teachers to identify all the places in the teacher guide and *Science Resources* book where any specific CA standard is addressed. Teachers can quickly find the page references for any point in the instruction. The Checklist provides a table of evidence showing where the CA standards are addressed through multiple exposures and with a minimum of 20–25% hands-on activities integrated cohesively into the instruction.

FOSS AND CALIFORNIA STANDARDS

The **Mixtures and Solutions Module** supports the following Physical Sciences Content Standards for grade 5.*

PHYSICAL SCIENCES

PS1 ***Elements and their combinations account for all the varied types of matter in the world. As a basis for understanding this concept:***

- PS1a *Students know* during chemical reactions the atoms in the reactants rearrange to form products with different properties.
- PS1b *Students know* all matter is made of atoms, which may combine to form molecules.
- PS1c *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 elemental metals.
- PS1d *Students know* each element is made of one kind of atom and the elements are organized in the periodic table by their chemical properties.
- PS1e *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.
- PS1f *Students know* differences in chemical and physical properties of substances are used to separate mixtures and identify compounds.
- PS1g *Students know* properties of solid, liquid, and gaseous substances, such as sugar ($C_6H_{12}O_6$), water (H_2O), helium (He), oxygen (O_2), nitrogen (N_2), and carbon dioxide (CO_2).
- PS1h *Students know* living organisms and most materials are composed of just a few elements.
- PS1i *Students know* the common properties of salts, such as sodium chloride (NaCl).

**Science Content Standards for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2000).

The **Mixtures and Solutions Module** supports the following Investigation and Experimentation Content Standards for grade 5.*

INVESTIGATION AND EXPERIMENTATION

I&E6 ***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. Students will:***

- I&E6a Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.
- I&E6c Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.
- I&E6f Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.
- I&E6g Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.
- I&E6h Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.
- I&E6i Write a report of an investigation that includes conducting tests, collecting data or examining evidence, and drawing conclusions.

**Science Content Standards for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2000).

Checklist of CA Standards for Mixtures and Solutions Investigation

Content Standard Focus	Investigation 1: Separating Mixtures	Teacher Guide *(Science Resources)* pages
PS1f, PS1g	**Part 1: *Separating Mixtures*—2–3 sessions**	**54–63 *(3–7)***
DATE OF INSTRUCTION	SESSIONS 1–2	
	Teacher presentation	58
	Hands-on with mixtures	58–59
	Writing in notebook (Mixtures)	59
	Hands-on with adding water to mixtures	59
	Teacher presentation	60
	Teacher-led class discussion	60
	Hands-on with screening and filtering mixtures	60–61
	Teacher-led class discussion	61
	Teacher presentation	61
	Writing in notebook (Thinking about Mixtures)	61
	Vocabulary instruction and content review	62
DATE OF INSTRUCTION	SESSION 3	
	Student reading with discussion questions	63 *(3–7)*
	Writing in notebook	63
PS1f, PS1g, I&E6f	**Part 2: *Separating a Salt Solution*—3 sessions**	**64–71 *(8–11)***
DATE OF INSTRUCTION	SESSIONS 1–2	
	Teacher-led class discussion	66
	Teacher presentation	66
	Hands-on with making and weighing a salt solution	66
	Writing in notebook (Making a Solution)	67
	Teacher-led class discussion	67
	Small group discussion	67
	Hands-on with evaporation investigation	67–68
	Teacher-led class discussion	68
	Writing in notebook (Evaporation Results)	69
	Embedded assessment—Response Sheet	69
	Vocabulary instruction and content review	70
DATE OF INSTRUCTION	SESSION 3	
	Student reading with discussion questions	71 *(8–11)*
PS1f, PS1g, I&E6c, I&E6f	**Part 3: *Separating a Dry Mixture*—4 sessions**	**72–77 *(12–14)***
DATE OF INSTRUCTION	SESSIONS 1–2	
	Teacher presentation	74
	Hands-on with making a dry mixture	74
	Writing in notebook (Separating a Dry Mixture)	74
	Hands-on with separating a dry mixture	74–75
	Writing in notebook (Separating a Dry Mixture)	75
	Teacher-led class discussion	75
DATE OF INSTRUCTION	SESSION 3	
	Student summary reading with discussion questions	76 *(12–14)*
	Writing in notebook	76
DATE OF INSTRUCTION	SESSION 4	
	Assess Progress—I-Check 1	77

Checklist of CA Standards for Mixtures and Solutions Investigation 2

Content Standard Focus	Investigation 2: Reaching Saturation	Teacher Guide *(Science Resources)* pages
PS1b, PS1f, PS1i	**Part 1: *Salt Saturation*—2 sessions**	**90–98 *(16–19)***
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion	92
	Small group discussion	92
	Teacher-led class discussion	92
	Teacher presentation	92–93
	Hands-on with salt solutions	93
	Teacher-led class discussion	93
	Teacher presentation	94
	Small group discussion	94
	Teacher-led class discussion	94–95
	Hands-on with filtering solutions	95
	Teacher-led class discussion	95
	Vocabulary instruction and content review	96–97
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	98 *(16–19)*
	Writing in notebook	98
PS1b, PS1f, PS1g, PS1i, I&E6f	**Part 2: *Epsom-Salts Saturation*—2 sessions**	**100–106 *(20–24)***
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	102
	Teacher-led class discussion	102
	Hands-on with Epsom salts solution	102–103
	Writing in notebook (Saturating a Solution)	103
	Teacher-led class discussion	103
	Teacher presentation	103–104
	Hands-on with evaporating Epsom salts solution	104
	Embedded assessment—Response Sheet	104
	Hands-on with evaporation results	104
	Teacher-led class discussion	104
	Vocabulary instruction and content review	105
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	106 *(20–24)*
	Writing in notebook	106
PS1f, PS1i, I&E6f, I&E6h, I&E6i	**Part 3: *The Saturation Puzzle*—4 sessions**	**107–111 *(25–26)***
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion	109
	Writing in notebook (Substance Data Sheet)	109–110
	Hands-on with mystery substance	109–110
	Teacher-led class discussion	110
DATE OF INSTRUCTION	SESSION 2	
	Student summary reading with questions	111 *(25–26)*
DATE OF INSTRUCTION	SESSIONS 3–4	
	Assess Progress—I-Check 2	111

Checklist of CA Standards for Mixtures and Solutions Investigation 3

Content Standard Focus	Investigation 3: Fizz Quiz	Teacher Guide *(Science Resources)* pages
PS1a, PS1b, I&E6f	***Part 1: Chemical Reactions*—2 sessions**	**124–133 *(28–31)***
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	127
	Hands-on with making solutions	127
	Teacher-led class discussion	127–128
	Teacher presentation	128–129
	Hands-on with mixing and observing solutions	129
	Teacher-led class discussion	129–130
	Teacher presentation	130
	Teacher-led class discussion	130–131
	Teacher presentation	131
	Vocabulary instruction and content review	132
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	133 *(28–31)*
	Writing in notebook	133
PS1a, PS1b, PS1d	***Part 2: Reaction Products*—3 sessions**	**134–141 *(32–33)***
DATE OF INSTRUCTION	SESSIONS 1–2	
	Teacher presentation	136
	Teacher-led class discussion	136
	Hands-on with filtering and evaporating solution	136–137
	Teacher-led class discussion	137
	Teacher presentation	137
	Hands-on with precipitate and vinegar	137
	Writing in notebook (Fizz-Quiz Observation, Reaction Analysis)	137
	Teacher presentation	137–139
	Vocabulary instruction and content review	140
DATE OF INSTRUCTION	SESSION 3	
	Student reading with discussion questions	141 *(32–33)*
	Writing in notebook	141
PS1a, PS1b	***Part 3: Equations*—2 sessions**	**142–150 *(34–38)***
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion	144
	Teacher presentation	144–145
	Hands-on with atom disks	145–147
	Teacher-led class discussion	147
	Teacher presentation	147–148
	Embedded assessment—Response Sheet	148
	Vocabulary instruction and content review	149
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	150 *(34–38)*
	Writing in notebook	150

Checklist of CA Standards for Mixtures and Solutions Investigation 3 (cont.)

Content Standard Focus	Investigation 3: Fizz Quiz (continued)	Teacher Guide *(Science Resources)* pages
PS1a, PS1f, I&E6f, I&E6g, I&E6h, I&E6i	**Part 4: *Reaction in a Zip Bag*—4 sessions**	**151–156 *(39–40)***
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion	153
	Teacher presentation	153
	Hands-on with reaction in zip bag	153
	Teacher-led class discussion	153
	Small group discussion	154
	Hands-on with new reaction in zip bag	154
	Teacher-led class discussion	154
	Teacher presentation	154–155
DATE OF INSTRUCTION	SESSION 2	
	Student summary reading with questions	156 *(39–40)*
	Writing in notebook	156
DATE OF INSTRUCTION	SESSIONS 3–4	
	Assess Progress—I-Check 3	156

Checklist of CA Standards for Mixtures and Solutions Investigation

Content Standard Focus	Investigation 4: Elements	Teacher Guide *(Science Resources)* pages
PS1d	**Part 1: *Elements and Atoms*—2 sessions**	**176–185 *(42–51)***
DATE OF INSTRUCTION	SESSION 1	
	Small group discussion	178
	Teacher-led class discussion	178–179
	Small group discussion	179
	Teacher-led class discussion	180
	Teacher presentation	180–181
	Hands-on using atom disks and periodic table	182 *(48–49)*
	Writing in notebook (Elements Checklist)	182
	Teacher-led class discussion	183
	Hands-on with Element Search homework	183
	Vocabulary instruction and content review	184
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	185 *(42–51)*
	Writing in notebook	185
PS1c, PS1d	**Part 2: *Metals*—2 sessions**	**186–193 *(52–58)***
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion	189
	Teacher presentation	189
	Teacher-led class discussion	189–190
	Teacher presentation	190
	Writing in notebook (Properties of Materials)	190
	Teacher-led class discussion	191
	Vocabulary instruction and content review	192
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	193 *(52–58)*
	Writing in notebook	193
PS1d, PS1e, PS1h	**Part 3: *Consumer Elements*—7 sessions**	**194–201 *(59–63, 64–67, 68–71, 72–75)***
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	196
	Hands-on with elements in consumer products	196
	Writing in notebook (Elements in Products)	196–197
	Teacher-led class discussion	198
DATE OF INSTRUCTION	SESSIONS 2–3	
	Student readings with discussion questions	199–200 *(59–67)*
	Writing in notebook	200
DATE OF INSTRUCTION	SESSION 4	
	Student summary reading with questions	201 *(68–75)*
DATE OF INSTRUCTION	SESSIONS 5–6	
	Assess Progress—I-Check 4	201
DATE OF INSTRUCTION	SESSION 7	
	Assessment: Posttest	201