

# CHECKLIST OF CA SCIENCE STANDARDS FOR GRADE 3

## MATTER AND ENERGY

### **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 Matter and Energy Module supports the following Physical Sciences Content Standards for grade 3.\*

#### PHYSICAL SCIENCES

- PS1** *Energy and matter have multiple forms and can be changed from one form to another. As a basis for understanding this concept:*
- PS1a *Students know* energy comes from the Sun to Earth in the form of light.
  - PS1b *Students know* sources of stored energy take many forms, such as food, fuel, and batteries.
  - PS1c *Students know* machines and living things convert stored energy to motion and heat.
  - PS1d *Students know* energy can be carried from one place to another by waves, such as water waves and sound waves, by electric current, and by moving objects.
  - PS1e *Students know* matter has three forms: solid, liquid, and gas.
  - PS1f *Students know* evaporation and melting are changes that occur when the objects are heated.
  - PS1g *Students know* that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original materials.
  - PS1h *Students know* all matter is made of small particles called atoms, too small to see with the naked eye.
  - PS1i *Students know* people once thought that earth, wind, fire, and water were the basic elements that made up all matter. Science experiments show that there are more than 100 different types of atoms, which are presented on the periodic table of the elements.
- PS2** *Light has a source and travels in a direction. As a basis for understanding this concept:*
- PS2a *Students know* sunlight can be blocked to create shadows.
  - PS2b *Students know* light is reflected from mirrors and other surfaces.
  - PS2c *Students know* the color of light striking an object affects the way the object is seen.
  - PS2d *Students know* an object is seen when light traveling from the object enters the eye.

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

The **Matter and Energy Module** supports the following Investigation and Experimentation Content Standards for grade 3.\*

### **INVESTIGATION AND EXPERIMENTATION**

*I&E5 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&E5a Repeat observations to improve accuracy and know that the results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated, methods being used, or uncertainty in the observation.
- I&E5b Differentiate evidence from opinion and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed.
- I&E5c Use numerical data in describing and comparing objects, events, and measurements.
- I&E5d Predict the outcome of a simple investigation and compare the result with the prediction.
- I&E5e Collect data in an investigation and analyze those data to develop a logical conclusion.

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



# MATTER AND ENERGY CHECKLIST

## FOSS Checklist of CA Science Standards for Matter and Energy Investigation 1

<b>Content Standard Focus</b>	<b>Investigation 1: Energy</b>	<b>Teacher Guide (Science Resources) pages</b>
<b>PS1a, PS1b</b>	<b>Part 1: Energy Sources—3 sessions</b>	<b>52–62 (3–9)</b>
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led discussion (energy)	56
	Teacher demonstration (flashlight challenge, demonstration, flashlight transparency)	56–57
	Hands-on with flashlight challenges	57–58
	Writing in notebook (Energy Source and Action)	59
DATE OF INSTRUCTION	SESSION 2	
	Teacher-led discussion (results on charts, sentence completions, summary of discussion)	59–60
	Writing in notebook	60
	Vocabulary instruction and content review	61
DATE OF INSTRUCTION	SESSION 3	
	Student reading with discussion questions	62 (3–9)
	Embedded assessment–Energy Sources Questions	62
<b>PS1a, PS1b, PS1c</b>	<b>Part 2: Converting Energy—3 sessions</b>	<b>63–70 (10–15)</b>
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion (review energy)	66
	Teacher demonstration (energy cards)	66–67
	Hands-on with energy cards	67
	Writing in notebook (Energy Conversion)	67
	Teacher-led discussion (discuss and summarize results)	68
	Vocabulary instruction and content review	69
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	70 (10–15)
DATE OF INSTRUCTION	SESSION 3	
	Embedded assessment–Response Sheet	70



**Checklist of CA Science Standards for Matter and Energy  
Investigation 1 (cont.)**

<b>Content Standard Focus</b>	<b>Investigation 1: Energy (continued)</b>	<b>Teacher Guide (Science Resources) pages</b>
<b><i>PS1d</i></b>	<b>Part 3: <i>Energy on the Move</i>—5 sessions</b>	<b>71–81 (16–19, 20–24)</b>
DATE OF INSTRUCTION	SESSIONS 1–2	
	Teacher-led discussion (stored energy, energy transfer, four stations, review recording)	74–75
	Hands-on with energy-transfer stations	75
	Writing in notebook (How Does Energy Travel?)	75–76
	Teacher-led class discussion	75–76
	Teacher-led discussion and explanation (energy transfer)	76
	Teacher-led discussion and demonstration (energy waves)	77
	Teacher-demonstration and discussion (water waves)	77–78
DATE OF INSTRUCTION	SESSION 3	
	View and discuss video ( <i>All About the Transfer of Energy</i> )	78–79
	Writing in notebook	78
	Vocabulary instruction and content review	79
DATE OF INSTRUCTION	SESSION 4	
	Student reading with discussion questions	80 (16–19)
DATE OF INSTRUCTION	SESSION 5	
	Student summary reading with discussion questions	81 (20–24)
	Assess Progress—I-Check 1 and review	81



# MATTER AND ENERGY CHECKLIST

## Checklist of CA Science Standards for Matter and Energy Investigation 2

Content Standard Focus	Investigation 2: Light	Teacher Guide (Science Resources) pages
<b>PS2b, PS2d</b>	<b>Part 1: Reflected Light—3 sessions</b>	<b>94–103 (26–30)</b>
DATE OF INSTRUCTION	SESSIONS 1-2	
	Teacher-led discussion (seeing, light)	97
	Teacher presentation (mirror exploration outdoors)	97–98
	Hands-on with mirrors	98
	Teacher-led class discussion and explanation (light sources, rays, reflection, sun image)	98-99
	Teacher demonstration (reflecting light, challenges)	99
	Hands-on with flashlights and mirrors	100-101
	Writing in notebook (Mirror Challenges sheet)	100-101
	Embedded assessment—Teacher Observation	101
	Shared student-created challenges	101
	Vocabulary instruction and content review	101
DATE OF INSTRUCTION	SESSION 3	
	Student reading with discussion questions	103 (26–30)
	Writing in notebook	103
<b>PS2a, PS2c, PS2d, &amp;E5d</b>	<b>Part 2: Colored Light—6 sessions</b>	<b>104–115 (31–35, 36–39)</b>
DATE OF INSTRUCTION	SESSIONS 1–2	
	Teacher-led class discussion (review light, vision)	107
	Teacher explanation (white light, absorbed)	107–108
	Hands-on with green gel and flashlights, red gel, cubes	108–110
	Teacher-led class discussion (results, recording)	108–110
	Writing in notebook (Unknown Colors)	110
	Teacher-led discussion (colors and colored light)	111
DATE OF INSTRUCTION	SESSIONS 3–4	
	View and discuss video ( <i>All about Light</i> )	112
	View colored-light simulation on <i>FOSSweb CA CD-ROM</i>	112
	Vocabulary instruction and content review	113
DATE OF INSTRUCTION	SESSION 5	
	Student reading with discussion questions	114 (31–35)
	Writing in notebook (Throw a Little Light on Sight)	114
DATE OF INSTRUCTION	SESSION 6	
	Student summary reading with discussion questions	115 (36–39)
	Assess Progress—I-Check 2 and review	115



## Checklist of CA Science Standards for Matter and Energy Investigation 3

Content Standard Focus	Investigation 3: Matter	Teacher Guide ( <i>Science Resources</i> ) pages
<b>PS1e</b>	<b>Part 1: <i>Fact of the Matter</i>—3 sessions</b>	<b>127–136 (41–44)</b>
DATE OF INSTRUCTION	SESSIONS 1-2	
	Teacher demonstration (materials, properties, matter, states, solid, liquid, gas, sorting activity)	130-131
	Hands-on with bag of materials for sorting	131
	Writing in science notebook (Solid, Liquid, or Gas?)	131
	Embedded assessment—Teacher Observation	132
	Teacher-led discussion (sorting results, chart)	132-133
	Writing in notebook (Properties of Solid, Liquid, and Gas)	133
	Teacher-led class discussion (gases, liquids, solids, unsure materials, summary)	133-134
	Writing in notebook	134
	Vocabulary instruction and content review	135
DATE OF INSTRUCTION	SESSION 3	
	Student reading with discussion questions	136 (41–44)
<b>PS1e, I&amp;E5a, I&amp;E5b, I&amp;E5c, I&amp;E5d, I&amp;E5e</b>	<b>Part 2: <i>Weighty Matters</i>—4 sessions</b>	<b>137–148 (45–48)</b>
DATE OF INSTRUCTION	SESSION 1	
	Teacher demonstration (mass, order objects, balance)	140
	Hands-on with objects and balance	140–141
	Teacher-led class discussion (units, weighing, discrepant event, weighing in grams)	141–142
	Hands-on with balance and mass sets	143
	Writing in notebook (Measuring Mass)	143
	Teacher-led class discussion (results, comparison)	144
DATE OF INSTRUCTION	SESSION 2	
	Teacher-led discussion (introduce problem, 100-gram mass, kilogram weight, kilogram hunt)	145
	Hands-on with balance and mass set	145
DATE OF INSTRUCTION	SESSION 3	
	Teacher-led discussion (sponge investigation)	145–146
	Hands-on with sponge, water, balance, mass set	146
	Writing in notebook (The Sponge Question)	146
	Teacher-led discussion (results)	146
	Vocabulary instruction and content review	147



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### Checklist of CA Science Standards for Matter and Energy Investigation 3 (cont.)

Content Standard Focus	Investigation 3: Matter (continued)	Teacher Guide (Science Resources) pages
<b><i>PS1e, I&amp;E5a, I&amp;E5b, I&amp;E5c, I&amp;E5d, I&amp;E5e</i></b>	<b>Part 2: Weighty Matters (continued)—4 sessions</b>	<b>137–148 (45–48)</b>
DATE OF INSTRUCTION	SESSION 4	
	Student reading and discussion questions	148 (45–48)
	Writing in notebook (Opinion and Evidence Questions)	148
	Embedded assessment–Notebook Sheet	148
<b><i>PS1e, I&amp;E5c, I&amp;E5d</i></b>	<b>Part 3: A Matter of Volume—6 sessions</b>	<b>149–158 (49–50, 51–54)</b>
DATE OF INSTRUCTION	SESSIONS 1–2	
	Teacher demonstration (capacity, vials)	152
	Hands-on with vials, water, cups	152
	Teacher-led class discussion and demonstration (results, standard, liter, milliliter, beakers)	152–153
	Hands-on with beakers	153
	Teacher-led class discussion (results)	153
DATE OF INSTRUCTION	SESSION 3	
	Teacher-led discussion and demonstration (review volume, syringe, graduated cylinder)	154
	Hands-on with syringes and graduated cylinders	154–155
	Writing in notebook (Measuring Volume)	155
	Embedded assessment–Teacher Observation and Notebook Sheet	155
	Teacher-led class discussion (capacity, volume)	155
	Vocabulary instruction and content review	156
DATE OF INSTRUCTION	SESSION 4	
	Student reading and discussion questions	157 (49–50)
	Writing in notebook	157
DATE OF INSTRUCTION	SESSION 5	
	Student summary reading and discussion questions	158 (51–54)
	Writing in notebook	158
DATE OF INSTRUCTION	SESSION 6	
	Assess Progress—I-Check 3 and review	158



## Checklist of CA Science Standards for Matter and Energy Investigation 4

Content Standard Focus	Investigation 4: Changing Matter	Teacher Guide ( <i>Science Resources</i> ) pages
<b><i>I&amp;E5a, I&amp;E5c</i></b>	<b>Part 1: <i>Measuring Temperature</i>—1 session</b>	<b>170–176</b>
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led discussion (temperature)	173
	Teacher demonstration (cup and water)	173
	Hands-on with temperature materials	173
	Teacher-led discussion and demonstration (results, thermometer, degree Celsius)	174
	Hands-on with thermometers	174–175
	Writing in notebook (Measuring Temperature)	174–175
	Teacher-led discussion (prediction, results)	175
	Vocabulary instruction and content review	176
<b><i>PS1f, PS1h, PS1i, I&amp;E5c, I&amp;E5d</i></b>	<b>Part 2: <i>Melting and Evaporation</i>—4 sessions</b>	<b>177–188 (56–58, 59–64)</b>
DATE OF INSTRUCTION	SESSION 1	
	Teacher demonstration (evaporation and melting investigation, table on board)	180
	Hands-on with melting materials	180–181
	Writing in notebook (Melting)	181
	Embedded assessment–Notebook Sheet	181
	Teacher-led class discussion (questions on sheet)	182
DATE OF INSTRUCTION	SESSION 2	
	Teacher-led discussion (review evaporation setup, measurements, results, heat energy, atoms, evaporation, summary)	182–185
	Vocabulary instruction and content review	186
DATE OF INSTRUCTION	SESSION 3	
	Student reading and discussion questions	187 (56–58)
	Writing in notebook	187
DATE OF INSTRUCTION	SESSION 4	
	Student reading and discussion questions	188 (59–64)
	Writing in notebook	188



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### Checklist of CA Science Standards for Matter and Energy Investigation 4 (cont.)

Content Standard Focus	Investigation 4: Changing Matter (continued)	Teacher Guide ( <i>Science Resources</i> ) pages
<b><i>PS1g, I&amp;E5a, I&amp;E5c, I&amp;E5d</i></b>	<b><i>Part 3: Reactions—5 sessions</i></b>	<b>189–199 (65–67, 68–71)</b>
DATE OF INSTRUCTION	SESSION 1	
	Teacher demonstration (substance, baking soda, vinegar, introduce investigation procedure, predict mass)	192–193
	Hands-on with baking soda and vinegar materials*	193
	Writing in notebook (Baking Soda and Vinegar)	193
	Teacher-led class discussion (results, repeat, reaction, carbon dioxide, change in mass)	194–195
DATE OF INSTRUCTION	SESSION 2	
	View and discuss video ( <i>All about Solids, Liquids, and Gases</i> )	195
	Writing in notebook ( <i>All about Solids, Liquids, and Gases</i> )	195–196
	Vocabulary instruction and content review	197
DATE OF INSTRUCTION	SESSION 3	
	Student reading and discussion questions	198 (65–67)
	Writing in notebook	198
DATE OF INSTRUCTION	SESSION 4	
	Student summary reading and discussion questions	199 (68–71)
	Writing in notebook	199
DATE OF INSTRUCTION	SESSION 5	
	Assess Progress—I-Check 4 and review	199
	Assess Progress—Posttest	199