

CHECKLIST OF CA SCIENCE STANDARDS FOR GRADE 4 MAGNETISM AND ELECTRICITY

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 **Magnetism and Electricity Module** supports the following Physical Sciences Content Standards for grade 4.*

PHYSICAL SCIENCES

PS1. *Electricity and magnetism are related effects that have many useful applications in everyday life. As a basis for understanding this concept:*

- PS1a. *Students know* how to design and build simple series and parallel circuits by using components such as wires, batteries, and bulbs.
- PS1b. *Students know* how to build a simple compass and use it to detect magnetic effects, including Earth's magnetic field.
- PS1c. *Students know* electric currents produce magnetic fields and know how to build a simple electromagnet.
- PS1d. *Students know* the role of electromagnets in the construction of electric motors, electric generators, and simple devices, such as doorbells and earphones.
- PS1e. *Students know* electrically charged objects attract or repel each other.
- PS1f. *Students know* that magnets have two poles (north and south) and that like poles repel each other while unlike poles attract each other.
- PS1g. *Students know* electrical energy can be converted to heat, light, and motion.

The **Magnetism and Electricity Module** supports the following Investigation and Experimentation Content Standards for grade 4.*

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. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.
- I&E6b. Measure and estimate the weight, length, or volume of objects.
- I&E6c. Formulate and justify predictions based on cause-and-effect relationships.
- I&E6d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.
- I&E6e. Construct and interpret graphs from measurements.
- I&E6f. Follow a set of written instructions for a scientific investigation.

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



Checklist of CA Standards for Magnetism and Electricity Investigation 1

Content Standard Focus	Investigation 1: The Force	Teacher Guide (Science Resources) pages
PS1f	Part 1: Magnets and Materials—3 sessions	50–62 (3–8)
DATE OF INSTRUCTION	SESSION 1	
	Hands-on with magnets	54
	Teacher-led class discussion	54
	Teacher presentation	55
	Hands-on with magnets and test objects	55
	Writing in notebook (Magnets and Objects)	55
	Teacher-led class discussion	56
	Teacher explanation	56
DATE OF INSTRUCTION	SESSION 2	
	Hands-on with magnets as iron detectors	57
	Teacher-led class discussion	57
	Hands-on with more magnetic interactions	57
	Teacher presentation, vocabulary introduction	58
	Small-group discussion	58–59
	Writing in notebook (Magnets and Poles)	59
	Small group discussion	59
	Writing in notebook (Magnetic Poles)	60
	Vocabulary instruction and content review	61
DATE OF INSTRUCTION	SESSION 3	
	Student reading with discussion questions	62 (3–8)
	Writing in notebook	62
PS1f	Part 2: More Magnetic Properties—2 sessions	63–68 (9–11)
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion (review)	65
	Hands-on with magnets	65
	Teacher-led class discussion	65–66
	Vocabulary instruction	67
	Embedded assessment—Response Sheet	67
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	68 (9–11)
	Writing in notebook	68
PS1f, I&E6c, I&E6d, I&E6e, I&E6f	Part 3: Breaking the Force—1–2 sessions	70–77
DATE OF INSTRUCTION	SESSIONS 1–2	
	Teacher introduction	72
	Hands-on with magnetic interactions	72–73
	Writing in science notebook	73
	Teacher presentation	74
	Hands-on with magnetic interactions	74–76
	Writing in science notebook (graphing)	75
	Vocabulary instruction and content review	77



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Checklist of CA Standards for Magnetism and Electricity Investigation 1 (cont.)

Content Standard Focus	Investigation 1: The Force (continued)	Teacher Guide (Science Resources) pages
PS1b, PS1f, I&E6c	Part 4: Detecting Magnetic Fields—3 sessions	78–87 (12–18)
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion	80
	Teacher demonstration	80
	Hands-on with magnetic interactions	80
	Teacher presentation	81
	Hands-on with magnetic interactions	82
	Writing in notebook (Detecting Magnets)	82
	Group presentations	83
	Vocabulary instruction and content review	84
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	85 (12–15)
	Writing in notebook	85
DATE OF INSTRUCTION	SESSION 3	
	Student summary reading with questions	86 (16–18)
	Writing in notebook	86
	Assess Progress—I-Check 1 and review	87



Checklist of CA Standards for Magnetism and Electricity Investigation 2

Content Standard Focus	Investigation 2: Making Connections	Teacher Guide (Science Resources)
PS1e	Part 1: Charge—2 sessions	100–106 (20–21)
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion	102
	Teacher presentation	102
	Teacher-led class discussion	102
	Teacher presentation	102–103
	Hands-on with balloons and static electricity	103
	Writing in notebook (Charge)	103
	Teacher-led class discussion	103
	Hands-on with static electricity	104
	Vocabulary instruction and content review	105
DATE OF INSTRUCTION	SESSION 2	
	Student reading with discussion questions	106 (20–21)
	Writing in notebook	106
PS1a, PS1g	Part 2: Lighting a Bulb—3 sessions	107–115 (22–25)
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	109
	Hands-on with lightbulbs and batteries	109–110
	Teacher-led class discussion	110
	Teacher presentation	110–111
	Writing in notebook (Lighting Bulbs)	111
DATE OF INSTRUCTION	SESSION 2	
	Hands-on with one-wire circuits	112
	Teacher-led class discussion	112
	Hands-on with one-wire circuits	112
	Writing in notebook	112
	Teacher-led class discussion	113
	Vocabulary instruction and content review	114
DATE OF INSTRUCTION	SESSION 3	
	Student reading and discussion questions	115 (22–25)
	Writing in notebook	115
PS1a, PS1g	Part 3: Making a Motor Run—2 sessions	116–121
DATE OF INSTRUCTION	SESSIONS 1–2	
	Teacher-led class discussion (review)	118
	Teacher presentation	118
	Teacher-led class discussion	118
	Teacher presentation	118–119
	Hands-on with motors and switches	119
	Teacher presentation	119
	Teacher-led class discussion	119
	Hands-on with switches and lightbulbs	119–120
	Writing in notebook (Drawings and Schematics)	120
	Teacher presentation	120
	Writing in notebook (Drawings and Schematics)	120
	Vocabulary instruction and content review	121



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Checklist of CA Standards for Magnetism and Electricity Investigation 2 (cont.)

Content Standard Focus	Investigation 2: Making Connections (continued)	Teacher Guide (<i>Science Resources</i>) pages
PS1a, I&E6c	Part 4: Conductors and Insulators—1 session	122–127
DATE OF INSTRUCTION	SESSION 1	
	Small group discussion	124
	Hands-on with test circuits	124
	Teacher presentation	124
	Hands-on with sorting conductors and insulators	125
	Teacher-led class discussion	125
	Writing in notebook (Conductors and Insulators)	125
	Teacher presentation	125–126
	Hands-on with conductor detector	126
	Writing in notebook (Conductors and Insulators)	126
	Vocabulary instruction and content review	127
PS1a, I&E6c	Part 5: Mystery Boards—3 sessions	128–133 (26–28)
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	131
	Teacher-led class discussion	131
	Hands-on with Mystery Circuits	131
	Writing in notebook (Mystery Boards)	131
	Teacher-led class discussion	132
	Writing in notebook (Bulbs and Motors)	132
DATE OF INSTRUCTION	SESSION 2	
	Student summary reading with questions	133 (26–28)
	Writing in notebook	133
DATE OF INSTRUCTION	SESSION 3	
	Assess Progress—I-Check 2 and review	133



Checklist of CA Standards for Magnetism and Electricity Investigation 3

Content Standard Focus	Investigation 3: Advanced Connections	Teacher Guide (Science Resources)
PS1a, PS1g	Part 1: Building Series Circuits—1 session	146–152
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	148
	Small-group discussion	148
	Hands-on with two-bulb circuits	148
	Teacher presentation	148–149
	Writing in notebook (Two Bulbs in Series)	149
	Teacher-led class discussion	149
	Hands-on with two bulbs in a series circuit	150
	Teacher-led class discussion	150
	Writing in notebook (Two Bulbs in Series)	150
	Teacher-led class discussion	151
	Hands-on with circuits (optional)	151
	Vocabulary instruction and content review	152
PS1a, PS1g	Part 2: Building Parallel Circuits—4 sessions	153–160 (30–35)
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	155
	Hands-on with parallel circuits	155
	Teacher-led class discussion	155–156
	Teacher presentation	156
	Writing in notebook (Two Bulbs in Parallel)	156
	Teacher-led class discussion	157
DATE OF INSTRUCTION	SESSION 2	
	Hands-on with parallel circuits	157
	Teacher-led class discussion	157
	Writing in notebook (Circuit Conclusions)	157
	Teacher-led class discussion	157
	Vocabulary instruction and content review	158
DATE OF INSTRUCTION	SESSION 3	
	Student reading and discussion questions	159 (30–35)
	Writing in notebook	159
DATE OF INSTRUCTION	SESSION 4	
	Assessment: Response Sheet	160
PS1a, PS1g, I&E6c	Part 3: The String-of-Lights Problem—3 sessions	161–166 (36–38)
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	163
	Hands-on with series and parallel circuits	163–164
	Teacher-led class discussion	165
	Vocabulary instruction and content review	165
DATE OF INSTRUCTION	SESSION 2	
	Student summary reading with questions	166 (36–38)
	Writing in notebook	166
DATE OF INSTRUCTION	SESSION 3	
	Assess Progress—I-Check 3 and review	166



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Checklist of CA Standards for Magnetism and Electricity Investigation 4

Content Standard Focus	Investigation 4: Current Attractions	Teacher Guide (Science Resources)
PS1c, I&E6a, I&E6b	Part 1: Building an Electromagnet—2 sessions	178–185 (40–42)
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	181
	Hands-on with magnet challenge	181
	Teacher-led class discussion	182
	Teacher presentation	182
	Hands-on with magnetic properties of the wire	182
	Teacher-led class discussion	182–183
	Teacher presentation	183
	Hands-on with electromagnet and wire placement	183
	Teacher-led class discussion	183
	Vocabulary instruction and content review	184
DATE OF INSTRUCTION	SESSION 2	
	Student reading and discussion questions	185 (40–42)
	Writing in notebook	185
PS1c, I&E6a, I&E6c, I&E6d, I&E6e	Part 2: Number of Winds—3 sessions	186–191 (43–45)
DATE OF INSTRUCTION	SESSION 1	
	Teacher presentation	188
	Small group discussion	188
	Hands-on with the number-of-winds investigation	188
	Writing in notebook (Winding Electromagnets)	188
	Teacher-led class discussion	189
DATE OF INSTRUCTION	SESSION 2	
	Teacher presentation	189
	Writing in notebook (Winding Electromagnets—graph)	189
	Small group discussion	189
	Embedded assessment—Response Sheet	189
	Vocabulary instruction and content review	190
DATE OF INSTRUCTION	SESSION 3	
	Student reading and discussion questions	191 (43–45)
	Writing in notebook	191
PS1c, I&E6c, I&E6d, I&E6f	Part 3: More Electromagnets—3–5 sessions	192–196 (46–48)
DATE OF INSTRUCTION	SESSIONS 1–3	
	Teacher presentation	194
	Small-group discussion	194
	Writing in notebook (Electromagnet Investigation)	194
	Hands-on with electromagnets	194
	Writing in notebook (Electromagnet Investigation)	195
	Teacher-led class discussion	195
	Vocabulary instruction and content review	195
DATE OF INSTRUCTION	SESSION 4	
	Student summary reading with questions	196 (46–48)
	Writing in notebook	196
DATE OF INSTRUCTION	SESSION 5	
	Assess Progress—I-Check 4 and review	196



Checklist of CA Standards for Magnetism and Electricity Investigation 5

Content Standard Focus	Investigation 5: Click It	Teacher Guide (Science Resources) pages
<i>PS1c, PS1d, PS1g</i>	Part 1: Reinventing the Telegraph—2 sessions	209–216 (50–54)
DATE OF INSTRUCTION	SESSION 1	
	Teacher-led class discussion	211
	Teacher presentation	211–212
	Hands-on with telegraph assembly	212–213
	Teacher presentation	213–214
	Hands-on with sending telegraph messages	214
	Writing in notebook (S-T-R-E-A-M Code)	214
	Vocabulary instruction and content review	215
DATE OF INSTRUCTION	SESSION 2	
	Student reading and discussion questions	216 (50–54)
	Writing in notebook	216
<i>PS1c, PS1d, PS1g, I&E6c</i>	Part 2: Long-Distance Messages—2 sessions	217–223 (55–65)
DATE OF INSTRUCTION	SESSION 1	
	Hands-on with telegraphs (review)	219
	Teacher presentation	219
	Hands-on with long-distance telegraphs	219–221
	Writing in notebook (Long-Distance Telegraphs)	221
	Teacher-led class discussion	221
	Vocabulary instruction and content review	222
DATE OF INSTRUCTION	SESSION 2	
	Student reading and discussion questions	223 (55–63)
	Writing in notebook	223
	Student summary reading with questions	223 (64–65)
	Writing in notebook	223
<i>I&E6a, I&E6c, I&E6d</i>	Part 3: Investigation and Experimentation—3 sessions	224–228
DATE OF INSTRUCTION	SESSIONS 1–2	
	Embedded assessment—Performance Assessment	227
	Teacher presentation	227
	Hands-on with magnetism and electricity	227
	Writing in notebook (Performance Assessment)	227
DATE OF INSTRUCTION	SESSION 3	
	Assessment: Posttest	228