# **Electricity and Magnetism**

| (eEdition                                    | Standards and Benchmarks Introducing Physical Science Unifying Principles of Physical Science The Nature of Science The Nature of Technology Using McDougal Littell Science | x<br>xiii<br>xxii<br>xxii<br>xxvi<br>xxviii |
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| SCIENTIFIC CO                                | FRONTIERS IN SCIENCE Electronics in Music   | 2   |
|  | TIMELINES IN SCIENCE The Story of Electronics   | 72  |
|  | Electricity   | 6   |
| the <b>BIG</b> idea  Moving electric charges | Materials can become electrically charged. CONNECTING SCIENCES Electric Eels  | 9<br>17                                     |
| transfer energy.                             | CHAPTER INVESTIGATION Lightning   | 18<br>26                                    |
|  | <b>B</b> Electric current is a flow of charge.  MATH IN SCIENCE Using Variables   | 28<br>35                                    |
|  | <b>2</b> Circuits and Electronics   | 40  |
| the BIG idea  Circuits control the flow of   | Charge needs a continuous path to flow.  SCIENCE ON THE JOB The Science of Electrical Work  | 43<br>50                                    |
| electric charge.                             | Circuits make electric current useful.  MATH IN SCIENCE Solving Percent Problems  | 51<br>56                                    |
|  | Electronic technology is based on circuits.  CHAPTER INVESTIGATION Design an Electronic   | 57  |

Communication Device

How can circuits control the flow of charge? page 40

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| <b>3</b> | Magnetism is a force t  |          |                 | 79<br>87   |
| 1        | Current can produce n   | nagnetis | m.              | 88         |
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| 30       | Generators supply electrical energy.  MATH IN SCIENCE Using Significant Figures |          |                 | 102<br>107 |
|          | Handbooks an  | nd Res   | sources         | R1         |
|          | Scientific Thinking   |          | Glossary        | R52        |
|          | Handbook  | R2       | Index           | R58        |
|          | Lab Handbook  | R10      | Acknowledgments | R64        |
|          | Math Handbook   | R36      | 3               |            |

Note-Taking Handbook R45

Current can produce magnetism, and magnetism can produce current.

| Features  |                 | Visual Highlights   |                      |
|---|-----------------|---|----------------------|
| MATH IN SCIENCE  Using Variables  Solving Percent Problems  Using Significant Figures | 35<br>56<br>107 | How a Photocopier Works<br>How Lightning Forms<br>Batteries<br>How a PC Works | 15<br>21<br>33<br>62 |
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| SCIENCE ON THE JOB  The Science of Electrical Work                                    | 50              |   |                      |
| FRONTIERS IN SCIENCE  Electronics in Music  | 2               |   |                      |
| TIMELINES IN SCIENCE  The Story of Electronics  | 72              |   |                      |

### **Internet Resources @ ClassZone.com**

|  |               | RESOURCE CENTERS  Lightning and Lightning Safety Electrochemical Cells Electrical Safety Electronics Electronic and Computer Research Magnetism Dams and Electricity Energy Use and Conservation | 20<br>32<br>46<br>57<br>75<br>80<br>103<br>104 |
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## **INVESTIGATIONS AND ACTIVITIES**

#### **EXPLORE THE BIG IDEA**

### Chapter Opening Inquiry

| 1. How Do the Pieces of Tape Interact? Why Does the Water React |    |
|---|----|
| Differently? Internet Activity: Static Electricity              | 7  |
| 2. Will the Flashlight Still Work? What's Inside a Calculator?  |    |
| Internet Activity: Circuits                                     | 41 |
| 3. Is It Magnetic? How Can You Make a Chain?                    |    |
| Internet Activity: Electromagnets                               | 77 |

#### **CHAPTER INVESTIGATION**

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| 2. Design an Electronic              |     |
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#### **EXPLORE**

#### **Introductory Inquiry Activities** Static Electricity 9 Static Discharge 18 Current 28 Circuits 43 Codes 57 79 Magnetism Magnetism from Electric Current 88 **Energy Conversion** 95

#### **INVESTIGATE**

#### Skill Labs Making a Static Detector Inferring 14 Conductors and Insulators Interpreting Data 22 Electric Cells 31 Inferring **Fuses** Making Models 48 Circuits Inferring 54 **Digital Information** 59 Making Models Earth's Magnetic Field Inferring 85 Electromagnets 90 Observing Electric Current Inferring 98 Power Making Models 105