

Introduction

It is important for all students to have a basic understanding of general science concepts and how science works in the world around them. The *PCI General Science Series* is PCI's answer to the growing need for general science teaching materials. This basic, comprehensive series provides teachers with a low-reading-level, age-appropriate resource to teach general science to students who are struggling with reading.

This unique series was designed for middle-school and high-school students who need help learning the basic concepts covered in general science courses. In order to help struggling readers understand complex science concepts, the student text, worksheets, laboratory activities, reviews, and tests in each program are written at a 3.0–4.5 reading level.

The Student Texts and Teacher's Guides in the *PCI General Science Series* are effective tools for students with learning differences, attention or behavior problems, and limited reading skills. This program is also helpful for at-risk students, ESL students, and adult learners.

Each program in the *PCI General Science Series* features a Student Text, activity sheets, demonstrations, laboratory activities, reviews, and tests. The *Physical Science* Student Text was developed as an abbreviated version of a traditional textbook. The Student Text covers information that all students should know, and the activity sheets and other activities in the *Physical Science* Teacher's Guide reinforce that information.

The *Physical Science* program features a 64-page, full-color Student Text and a 201-page, reproducible Teacher's Guide. Provide each student with a Student Text, and reproduce the accompanying worksheets from the Teacher's Guide to reinforce the information in the Student Text. Perform the demonstrations for the students and guide them through the laboratory activities to further enhance student learning.

The nine chapters in the Student Text are divided into short sections. Each section features a list of vocabulary words; full-color visual aids, such as charts and diagrams; and full-color photographs and illustrations.

The corresponding worksheets in the Teacher's Guide allow students to practice reading-comprehension skills while answering content-area recall questions. The worksheets include a variety of activities, including multiple choice, true/false, matching, fill-in-the-blank, short answer, crossword-puzzle, and word-search activities.

For visual learners, one teacher demonstration is included for each chapter. The demonstrations include materials lists and directions on how to perform the demonstration. These can be used at the beginning of a chapter as an introduction to the material, at the end of a chapter as a way to tie key concepts together, or in any way the teacher wishes.

This program has a hands-on component. One laboratory activity is included for each chapter. Students will practice the steps of the scientific method including hypothesis,

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procedure, data collection, analysis, and conclusion, while they synthesize what they have learned from reading the Student Text.

Since laboratory safety is one of the first things taught and reinforced in every science course, PCI assumes that all students will demonstrate safe practices during laboratory investigations. Teachers and students should follow school district safety guidelines and common sense while performing the demonstrations and laboratory investigations described in this Teacher's Guide.

For assessment purposes, each of the nine chapters has a corresponding review and test. Once students have read a chapter and completed the accompanying worksheets, you can test their knowledge of the information in the chapter by having them complete the review and test. Students can use the review worksheets to prepare for the test.

Written by a certified secondary science teacher and special education teacher, *Physical Science* contains age-appropriate examples and high-interest demonstrations to pique students' interest in science concepts. The program has been written with state standards and the National Science Education Standards in mind.

The *Physical Science* Student Text and Teacher's Guide focus on the most basic, general concepts of physical science. Students will learn about matter, force, and different kinds of energy.

OBJECTIVES

After completing this program, the student will be able to:

- define matter and energy.
- demonstrate the measurement of mass and volume using a balance and a graduated cylinder.
- list the parts of an atom.
- define element and compound and explain that compounds are made up of elements.
- explain that new substances can be made when two or more substances are combined.
- compare the properties of new substances to original substances.
- describe the states of matter.
- state the law of conservation of mass.
- classify substances according to their physical and chemical properties.

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- identify everyday examples of chemical changes.
- explain the relationships between force and motion.
- demonstrate how unbalanced forces cause changes in an object's velocity.
- explain the scientific concepts of work and energy.
- state the law of conservation of energy.
- identify simple and complex machines.
- explain Newton's three laws of motion.
- list examples of potential and kinetic energy.
- describe the movement of heat by convection, conduction, and radiation.
- explain how waves are generated and how they can travel through different mediums.
- describe the characteristics and parts of waves.
- describe wave interactions including interference, reflection, refraction, and diffraction.
- explain the Doppler effect.
- explain the concept of light years to describe distances in the universe.
- identify opaque, transparent, and translucent substances.
- explain charging of objects by friction, conduction, and induction.
- define electric force.
- describe the use of electromagnetic waves in different types of technology such as microwaves and radar.
- compare series and parallel circuits.
- define magnetic force.
- explain how a compass works.
- explain the relationship between an electric current and the strength of its magnetic field in an electromagnet.

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HOW TO USE

Student Text

Provide each student with a copy of the Student Text. Depending on the type of classroom setting and the comfort level of the students, the Student Text can be read aloud in class or read silently by individual students. Students should read a section of the Student Text and then complete the worksheets in the Teacher's Guide that correspond to that section.

Worksheets

Each set of worksheets in this reproducible Teacher's Guide corresponds to a section in the Student Text. Students can refer to the Student Text while completing the worksheets. Each set of worksheets lists the pages in the Student Text to which students can refer. Remind students that some of the activities review material from previous sections. Students can complete the worksheets individually, in pairs, or in small groups.

Demonstrations

A teacher demonstration suggestion is included for each chapter. Each simple demonstration requires minimal preparation time and only a few materials. You can use the demonstrations as a catalyst for classroom discussion.

Laboratory Activities

A laboratory activity is included for each chapter. Guide students through each laboratory activity after they have read the corresponding chapter and completed the worksheets. Each laboratory activity has a page with instructions to help facilitate the investigation.

Chapter Reviews

To help students study for each chapter test, a set of review worksheets is provided. Allow the students to use the Student Text when they answer the review questions. The completed review worksheets should be taken home and studied before the chapter test.

Chapter Tests

A chapter test is provided for each chapter of the Student Text. The tests assess the most important information covered in each chapter and determine whether students have mastered each objective.

Answer Key

For your convenience, an answer key for the worksheets, reviews, and tests is included at the end of the Teacher's Guide. Answers for the laboratory activities are included on each laboratory activity teacher notes page.