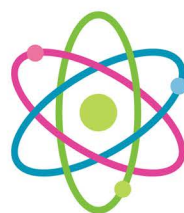
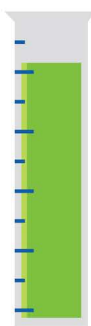


FEATURES Earth Sciences • Physical Sciences
Life Sciences • Space Sciences • Scientific Equipment

Stress-Free Science

A Visual Guide
to Acing Science
in Grades 4–8



A **Prufrock Press** Book

Laurie E. Westphal, Ed.D.



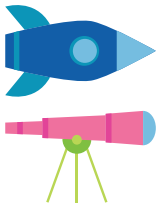
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 **Routledge**
Taylor & Francis Group
NEW YORK AND LONDON

Library of Congress Control Number:2019954824

First published in 2020 by Prufrock Press Inc.

Published in 2021 by Routledge
605 Third Avenue, New York, NY 10017
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

Routledge is an imprint of the Taylor & Francis Group, an informa business

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Cover and layout design by Allegra Denbo

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ISBN: 9781032142159 (hbk)

ISBN: 9781646320165 (pbk)

DOI: 10.4324/9781003238270

Special thanks and lots of love to:
Ken and Irene Westphal, my mom and dad.

You have always been there for me, excluding the
backyard swing incident, of course.



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Table of Contents

Introduction	1
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Visual Definitions by Topic

★ Scientific Equipment	5
★ The Scientific Process	11
★ Measurements and Units	19
★ Life Sciences	23
★ Physical Sciences	53
★ Earth Sciences	81
★ Space Sciences	101

Quick Reference Guides

★ Using Lab Equipment	111
★ The Scientific Method	116
★ Common Lab Safety Rules	118
★ Collecting and Recording Data	119
★ Graphing Data	120
★ Atoms	126
★ Genetics	128
★ Solubility Curves	131
★ Formulas	133
★ Tables and Charts	136

References	149
Index	151
About the Author	159

Introduction

Science is a way of thinking much more than it is a body of knowledge.

—Carl Sagan

As Carl Sagan stated, the study of science is much more than just facts and knowledge; yet without the specialized vocabulary that accompanies the scientific concepts and processes, you may find yourself at a disadvantage as you strive to express yourself scientifically. That is where *Stress-Free Science* comes to the rescue.

This visual guide is much more than a list of words and definitions. The vocabulary used in science is vast. Many of the words resemble commonly used words; however, their scientific usage may be very different. There also are many science words that are new and difficult for students to remember. These are the terms found in this guide—those new and seemingly difficult words or those that have significantly different definitions than common language. You will also find common examples, graphics, and illustrations to build your understanding.

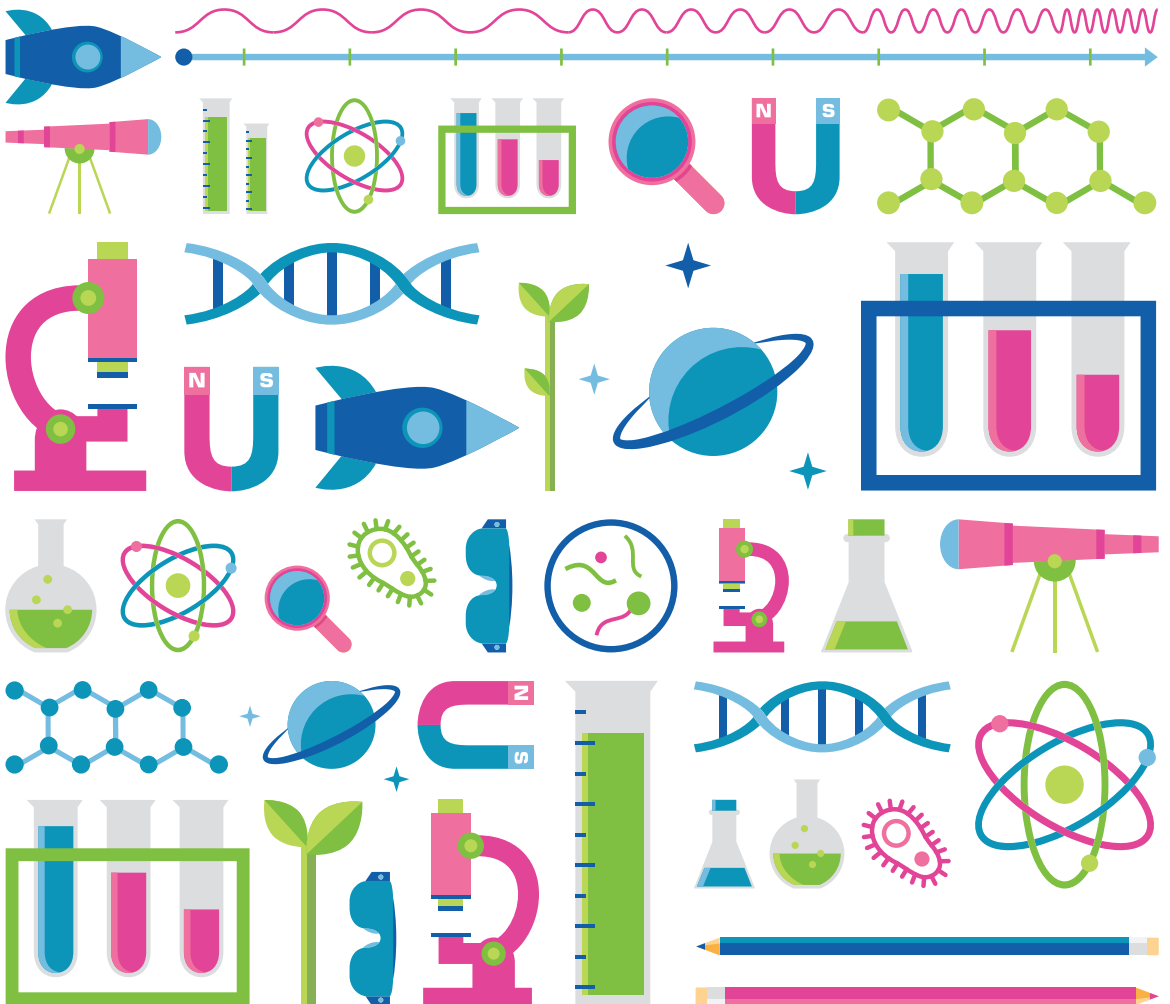
This book also addresses other information that will help you on your way to becoming a scientific thinker. You will find diagrams and graphics of the different cycles studied in the science classroom. There also is a reference guide devoted to commonly used formulas and units used in science. This book has an entire section devoted to the equipment and glassware that you may work with in the science classroom, including a definition and visual (for easy identification) and if appropriate, specific directions for the equipment's use—such as how to transport liquid in an eyedropper without blowing air into the liquid and turning it upside down.

In addition to equipment, there also is a quick reference section to assist you with the various steps of the scientific method, from creating testable questions to writing procedures and how to visibly present data through the creation of different types of graphs. You can quickly flip to the instructions on multiple line graphs and be on your way to producing your own. These

quick reference pages are meant to assist you in the steps of the scientific method in a quick, concise way.

Once you use a reference like this book, you'll agree that it truly is absolutely essential. It will be the reference material you will use again and again to supplement and reinforce topics throughout your science classes.

Visual Definitions by Topic





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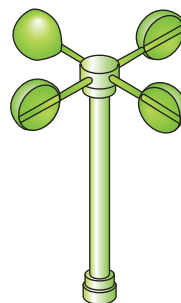
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SCIENTIFIC EQUIPMENT

Anemometer

A weather instrument used to measure wind force and speed.



Barometer



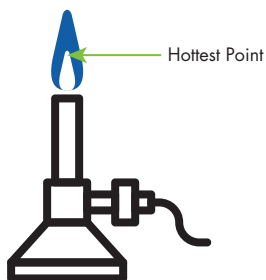
A weather instrument used to measure atmospheric pressure. Below 29 is considered rainy or stormy, while 30 or above is considered fair weather.

Beaker

A container used to transport, pour, or mix liquids. It cannot measure an exact amount of liquid.



Bunsen Burner



A small burner used in the laboratory. It is connected to a gas source and uses a very hot flame. When heating, the hottest area is at the top of the inner core.

Compass

An instrument used to find direction. It usually is made of a magnetic needle that is free to move until it is lined up with Earth's magnetic field.



CO-FU

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Compound Light Microscope

A light microscope that has more than one lens that is used to magnify a small object or specimen. See page 111 for instructions for using a microscope.



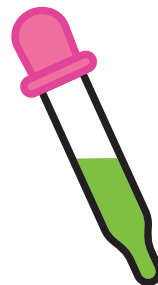
Erlenmeyer Flask



A flat-bottomed, cone-shaped flask used for mixing and heating liquids. A stopper can be used to seal it.

Eyedropper

A tube with a rubber bulb on the end that is used to pull liquid into the tube. It is used for transporting small amounts of liquid. See page 114 for instructions for using an eyedropper.



Eyewash



Safety equipment that is used to flush or wash the eyes in case something gets into them during a lab experiment.

Fire Blanket

A blanket that be used to put out a small fire or wrap around someone in case of fire. They are usually stored in red bags or boxes.



Funnel



A utensil used to pour small solids or liquids into small-mouthed containers. It is usually made of either plastic or glass.

Goggles

Safety equipment used to protect your eyes during an experiment. Some goggles just protect your eyes from projectiles; others also protect against gasses that might be created during an experiment.

Graduated Cylinder

A cylinder that has been marked with different “graduations,” or lines and numbers, to show the level of the liquid put in it. Always read the meniscus (see p. 8), or the bottom of the curved liquid, when using a glass graduated cylinder. See page 114 for instructions for reading a graduated cylinder.



Hand Lens



A handheld magnifying glass that allows you to look closely at objects. The typical magnification is 10x; it makes the object you are examining 10 times bigger.

Hot Plate

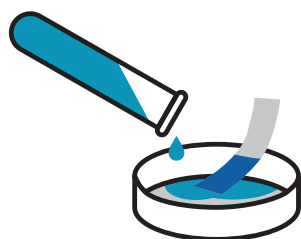
A device used to heat beakers or flasks. It either has coils or a ceramic plate for heating. Always be sure the cord is tucked away for safety!



Hydriion Paper

A special kind of litmus paper that turns different colors depending on the pH (acidity or alkalinity) of the substance being tested. Once the substance is tested, you compare the color of the paper to the color on the container to determine the pH.

Litmus Paper



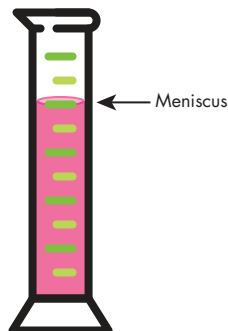
Paper used to determine pH. The paper changes color depending on whether it has been put in an acid, base, or neutral substance. Red litmus paper will turn blue when placed in a base, and blue litmus paper will turn red when placed in an acid.

ME-SP

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Meniscus

The lowest part of the curve created by water when it is placed in a glass graduated cylinder. When reading the exact amount in a glass graduated cylinder, you look at where the meniscus lies.



Meter Stick

A common instrument for measuring length in the classroom. It is broken down into centimeters, the large numbers on the meterstick ($100\text{ cm} = 1\text{ m}$), and millimeters, the small lines ($1,000\text{ mm} = 1\text{ m}$).

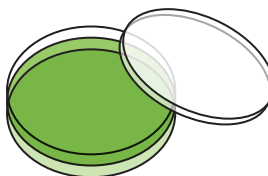
Pan Balance



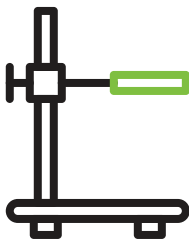
A balance that uses two different pans to find the mass of an object. See page 113 for instructions for using a pan balance.

Petri Dish

A shallow dish approximately 10 centimeters in diameter, used for growing bacteria cultures or evaporating crystals.



Ring Stand



A metal stand that usually includes a ring and is used to support glassware during heating or other lab equipment during an experiment.

Spring Scale

A measuring device or scale that uses a spring to measure the weight of an object. The most common unit measured using a spring scale is Newtons; 4.45 Newtons equals 1 pound. See page 113 for instructions for using a spring scale.

