

Years 5–8

**REAL-LIFE**  
**SCIENCE**  
**MYSTERIES**

Colleen Kessler



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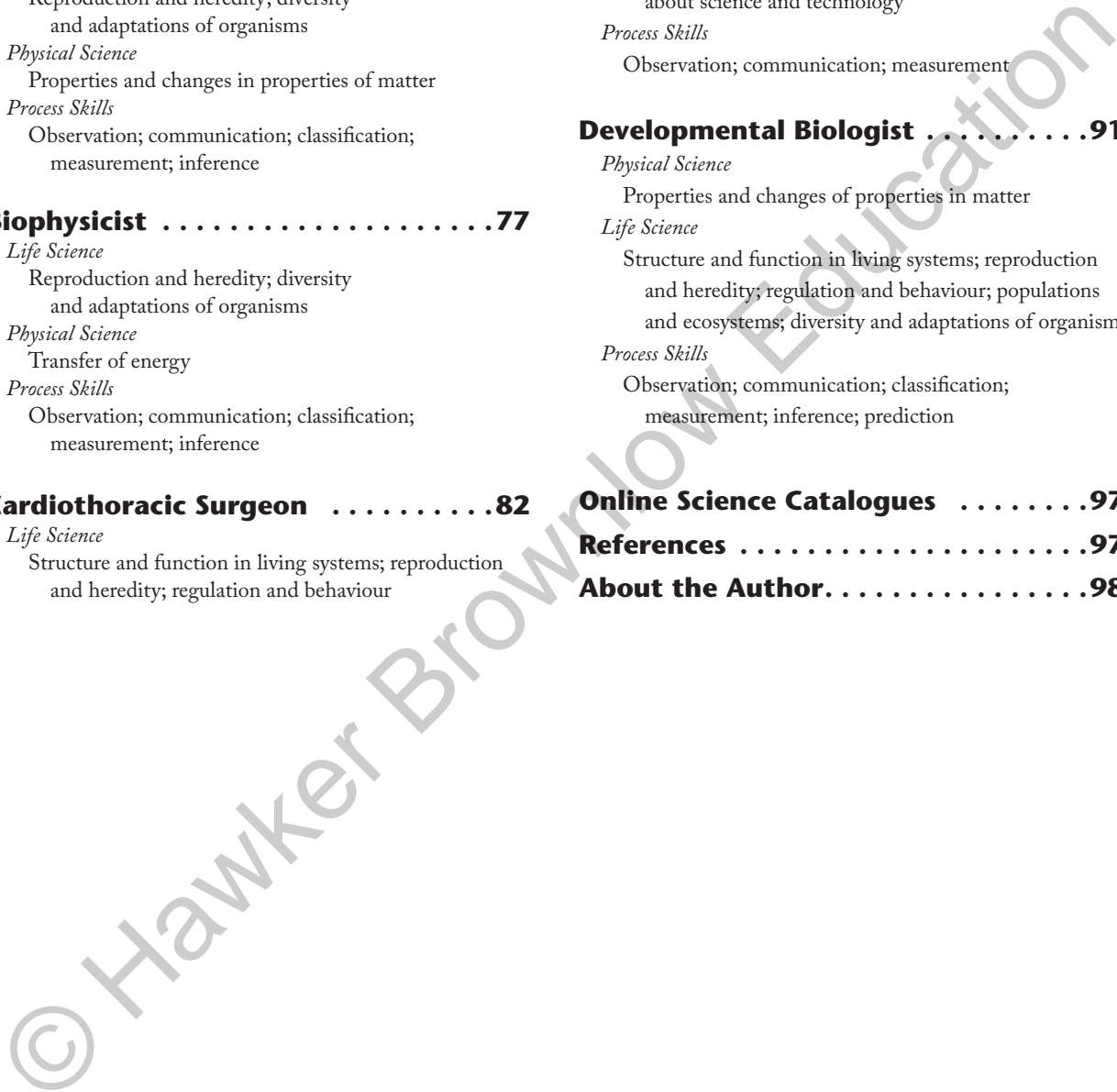
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# About This Book

You picked up this book, so there is a good chance that you are looking for a more engaging and interesting way to get your students fired up about the science you need to teach them. As a teacher, you need to answer the questions your students often – and rightfully – ask, “Why do I need to learn this?” Or, “When will I ever need this again?” *Real-Life Science Mysteries* was written to help you make your science classes more fun *and* to answer your students’ questions of, “What’s the point?”

This book provides you with an opportunity to break down the walls of the classroom and invite the real world inside: a world where people – everyday people – are doing science as a career. All over the world, in large cities, small towns, suburbs and on farms, people face real mysteries and solve them with real science. Some solutions may help create a new species of tulip, while others may save a life, but all are approached with a scientific eye and a willingness to try.

Most kids are curious, but not all continue to look at the world with curiosity and wonder as they grow. This book can help you show your students that there *are* people – adults – out there playing with puzzles, solving mysteries and indulging in a childlike wonder about the world and how it works. Some of these people have agreed to let you and your students into their minds. They have agreed to give your students a chance to solve some of the mysteries that they have pondered. In this book, you will meet 18 diverse people working at some of the coolest jobs on the planet.

Each person will share highlights about their job, talk about some of the science involved and challenge your students to solve some problems, observe their world or experiment with nature.

A common theme in the responses I received from the people profiled in this book was that the science they liked the most in school was the science they got to *do*. I tried to include as many hands-on activities as possible to help you insert more *doing* into your science classes and your life. No matter what type of classroom you have or what type of school you are a part of, you will have lots of fun discovering science with your students through the activities in this book.

Each of the men and women interviewed for this book use science in different ways. They may focus primarily on the workings of the human body, why snakes and insects do what they do, how to showcase human structures using the beauty of horticulture or how to find water deep under the rocks and sand of the desert, but they all have similarities, too. Make sure that you share the connections between domains that the people in each profile share. For example,

while Dr Robert Mason spends time in the field observing wild garter snakes, he documents those observations, investigates the chemistry of the snakes' communication, shares his findings with others and designs his own inquiries. In fact, the skills of inquiry, observation and communication are central to everyone's work. These skills are central to science, and to life.

## Standards

This book was created with the US National Science Education Standards for Years 5–8 in mind, the first of which expects students to develop the abilities necessary to do and understand scientific inquiry (National Research Council, 1996). Each section of this book is tied to inquiry – learning by doing. Students who are actively engaged in their learning retain what they have learned. They internalise it and get excited about it. When you use inquiry and real life as a motivation for and method of learning, kids will want to do it. They will know they can, and perhaps they will want to continue doing science as a career of their own.

I have listed the National Science Education Standards underneath each section title in the Table of Contents. Although there are seven standards, I chose to focus on four: NS.5–8.2 (Physical Science), NS.5–8.3 (Life Science), NS.5–8.4 (Earth and Space Science) and NS.5–8.5 (Science and Technology). I also have chosen to include the process skills covered or discussed in each section. The reason for this method of organisation is simple: Standards NS.5–8.1 (Science as Inquiry), NS.5–8.6 (Personal and Social Perspectives) and NS.5–8.7 (History and Nature of Science) are woven throughout each section. These standards integrate naturally into the others and are present in most sections in some form.

Perhaps more important than teaching students about specific science content is teaching them to use science process skills. These skills – observation, communication, classification, measurement, inference and prediction – are skills that kids will use in every area of their lives. Science is about asking questions and finding answers to those questions. If you want your students to grow up to be discriminating adults, they need to know that they can, and should, question their surroundings and that they have the ability to find out the answers to whatever questions they have.

While the activities in this book are not based on Australian learning standards, the National Science Education Standards emphasise the inquiry skills necessary for scientific learning in not

only state standards, but also the Australian Curriculum and in science classrooms across the globe.

## How to Use This Book

*Real-Life Science Mysteries* can be used in many ways. For example, it can be treated as a supplement to your science curriculum. Have small groups of students work on a section together, or try the activities as a class. You could even have some high-ability students work on sections individually. You could go section by section, learning about the different jobs one at a time in the order that they are presented, using the experiments and activities as a fun “break” from the everyday curriculum you need to teach. Or, you could look at the skills and standards listed in the Table of Contents and pick the section that relates to the current topic you are presenting. No matter what you choose, you can’t go wrong. However you decide to use this book, photocopy the “Hey Kids!” letter on page xi and pass that out first. There is no greater motivation for students than to realise that what they are learning is part of a bigger picture. Science really is something that can help them in their lives – even if they don’t want to work in a lab. There are plenty of opportunities out there that allow kids to hang on to their curiosity and make a living they will love.

Most of the activities, investigations and experiments in this book use everyday materials – those that you would expect to find in a well-equipped middle years science department. I thought about things I could have done with the kids in my own classroom. Sometimes, though, a person suggested an activity that could be done with kids to illustrate a point in their interview, show kids what kinds of things they do on a daily basis or show them something that was just plain cool. For these activities, check out the Resources list at the end of the book for websites and books.

A few activities, such as “Let’s Bake!”, may lend themselves better to take-home projects. You may want to offer these as extensions that kids can do at home with adult support. Others, like the sugar glass activity, may be better done as a teacher demonstration. As with anything you plan to do with your students, give careful thought to how it would work in your classroom with your students. For example, if you don’t have access to specific computer programs mentioned, like Excel, substitute another data-processing software, or have your students gather data and calculate results by hand. Adapt any of the activities as experiments, demonstrations,

extensions or independent work as you see fit. Enjoy the science ... and make this book your own.

For materials like insects, pond water, soil samples and bark, you will need to take a walk outside. I am confident that with a little effort, each of these things can be found in nature almost anywhere in Australia. Although species may vary and depend on the season, you *can* find what you need in the great outdoors. I did.

Maybe if you immerse yourself in the beauty and wonder of nature in your hunt for real science to investigate, you will inspire others to do the same. You might become the biology teacher who motivates a future scientist to build off of Dr Laura Dyer's work as she searches for a cure for heart defects in infants. You may be the chemistry teacher who spurs a would-be chemist to investigate pheromones in insects like Dr James T. Costa. You might be the person who mentors a future middle years science teacher like Ben Singer. You never know where science will lead you ...

Our country faces a crisis – the future of science in Australia is uncertain. Fewer students are seeking advanced degrees in the sciences. We lag behind other countries in the areas of maths and science. You can help. You can be the motivator of a future generation of scientists. Your students can be encouraged to be future scientists. One person is all it takes. Will it be you?

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