



MICHAEL'S *RACING MACHINE*



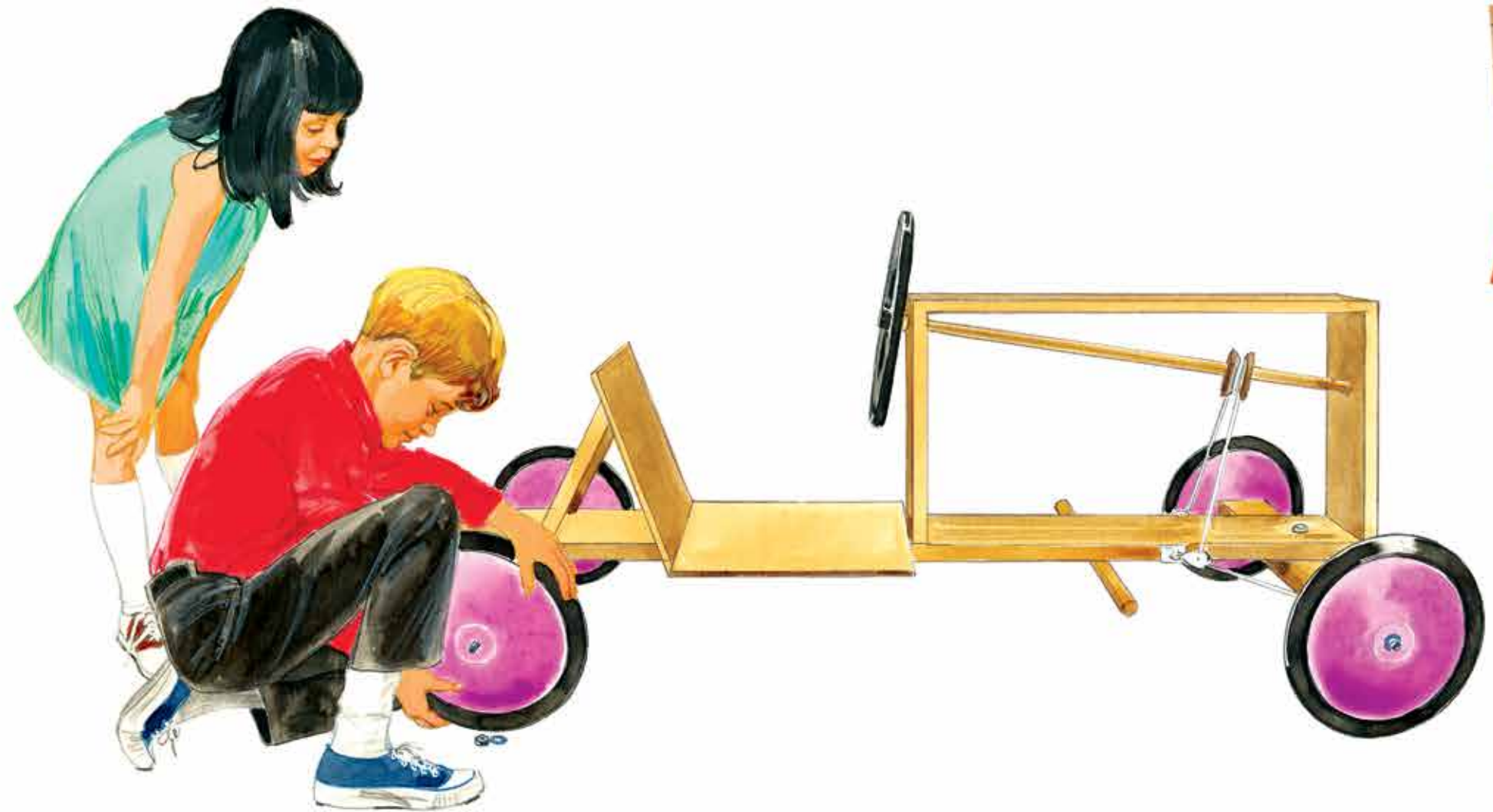
By **Lawrence F. Lowery**

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By **Lawrence F. Lowery**

Illustrated by **Richard Loehle**





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Safety note for teachers, parents, and students: When using tools such as those in this story, always maintain a safe environment. Most notably, wear personal protection including safety goggles and gloves as appropriate and take recommended safety precautions at all times.



Introduction

The *I Wonder Why* series is a set of science books created specifically for young learners who are in their first years of school. The content for each book was chosen to be appropriate for youngsters who are beginning to construct knowledge of the world around them. These youngsters ask questions. They want to know about things. They are more curious than they will be when they are a decade older. Research shows that science is students’ favorite subject when they enter school for the first time.

Science is both *what* we know and *how* we come to know it. What we know is the content knowledge that accumulates over time as scientists continue to explore the universe in which we live. How we come to know science is the set of thinking and reasoning processes we use to get answers to the questions and inquiries in which we are engaged.

Scientists learn by observing, comparing, and organizing the objects and ideas they are investigating. Children learn the same way. The thinking processes are among several inquiry behaviors that enable us to find out about our world and how it works. Observing, comparing, and organizing are fundamental to the more advanced thinking processes of relating, experimenting, and inferring.

The five books in this set of the *I Wonder Why* series focus on some content of the physical sciences. The physical sciences consist of studies of the physical properties and interactions of energy and inanimate objects as opposed to the study of the characteristics of living things.

Physics, along with mathematics and chemistry, is one of the fundamental sciences because the other sciences, such as botany and zoology, deal with systems that seem to obey the laws of physics. The physical laws of matter, energy, and the fundamental forces of nature govern the interactions between particles and physical entities such as subatomic particles and planets.

These books introduce the reader to several basic physical science ideas: exploration of the properties of some objects (*Rubber vs. Glass*), interaction with the properties of light and the effect of light on objects (*Light and Color; Dark as a Shadow*), the nature of waves and sound (*Sounds Are High, Sounds Are Low*), and the use of simple machines to accomplish work (*Michael’s Racing Machine*).

The information in these books leads the characters and the reader to discover how opaque objects block light and cast shadows, that different objects have special and useful properties (glass and rubber), that simple mechanical tools reveal some of the laws of physics, and that “nontouchable items” such as light and sound energy also have distinctive properties.

Each book uses a different approach to take the reader through simple scientific information. One book is expository, providing factual information. Several are narratives that allow a story involving properties of objects and laws of physics to unfold. Another uses poetry to engage the characters in hands-on experiences. The combination of different styles of artwork, different literary ways to present information, and directly observable scientific phenomena brings the content to the reader through several instructional avenues.

In addition, the content in these books supports the criteria set forth by the *Common Core State Standards*. Unlike didactic presentations of knowledge, the content is woven into each book so that its presence is subtle but powerful.

The science activities in the Parent/Teacher Handbook section in each book enable learners to carry out their own investigations related to the content of the book. The materials needed for these activities are easily obtained, and the activities have been tested with youngsters to be sure they are age appropriate.

After completing a science activity, rereading or referring back to the book and talking about connections with the activity can be a deepening experience that stabilizes the learning as a long-term memory.

When he finished sweeping, Michael used the broom to hold the door open. Luci began asking more questions.

“Are there any other machines besides levers?”

“Lots,” said Michael.

“Name one,” insisted Luci.

“A wedge. A wedge is another machine,” Michael replied.

“A wedge is like a hill. A wedge is a simple machine because a hill is a simple machine.”



“How can a hill be a machine?” asked Luci. “I don’t understand that at all.”

“Well,” began Michael, “suppose you wanted to lift something up to a higher place but it was too heavy to lift. You might be able to raise the thing by pushing or pulling it up a hill. Moving something up a hill makes the work seem easier to do. That is why when you use a hill, it is a machine.”





“Let’s look for more wedges,” said Luci.
She began looking at Michael’s collection of tools.
“Here are some wedges,” said Luci, smiling as she
found a box of nails. “The tiny points are like tiny hills.”



Michael showed Luci a box of screws. Each screw looked
like it had a tiny hill wrapped around a tiny pole.
“Look,” said Michael, “if you think about it, you can
imagine a road winding around a mountain. That makes
a screw a machine, too, because it is like a winding hill,
and remember, a hill can make work easier to do.”



MICHAEL'S RACING MACHINE

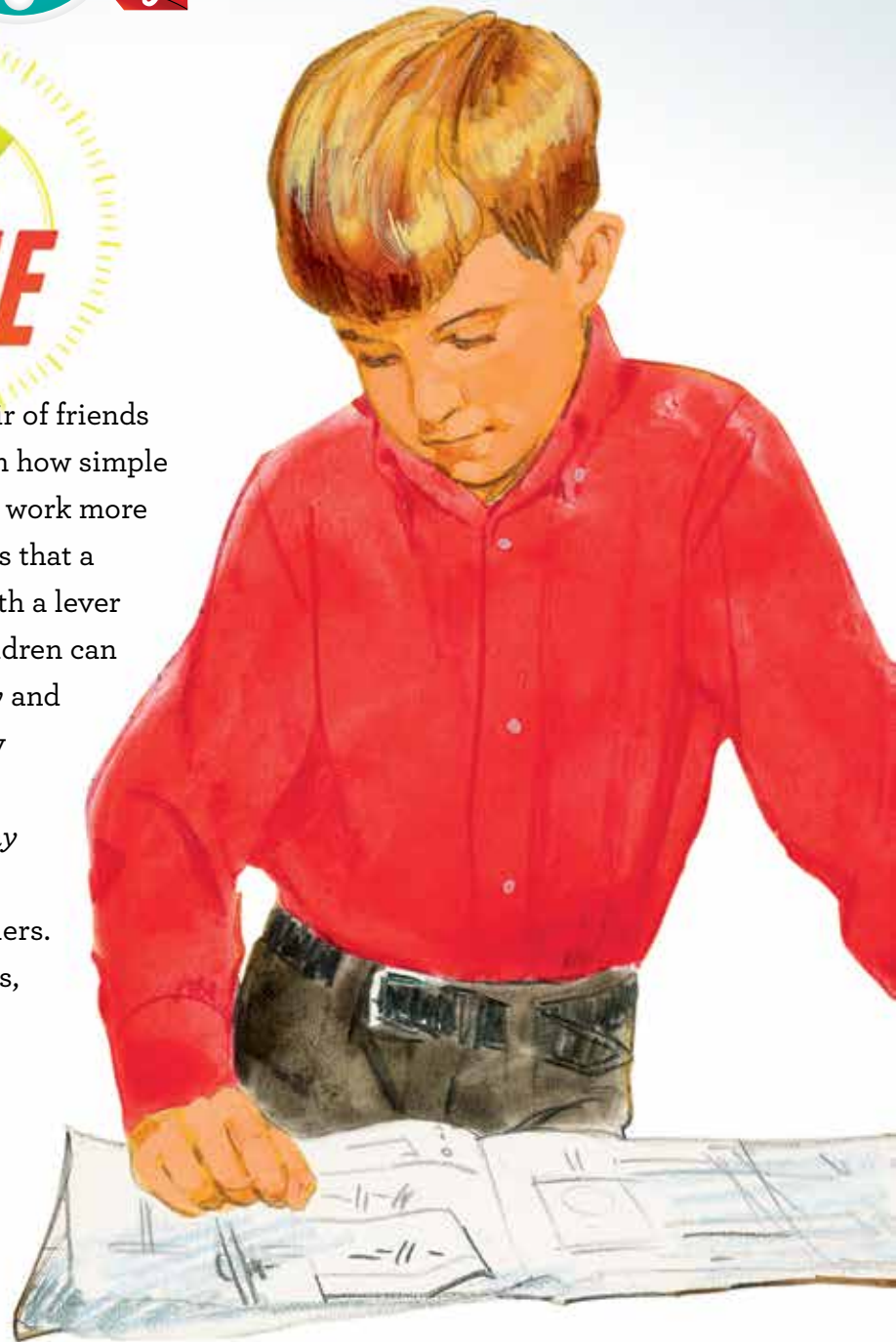
While building a soapbox racing car, a pair of friends provide an easy-to-understand lesson in how simple machines are all around us, making our work more efficient. Michael and Luci show readers that a broom is a lever, nails are wedges, and a screwdriver is both a lever and a wheel-and-axle. The two also prove that curious children can be just like scientists, making observations and using *how* and *what* questions to explore physical science principles they encounter all the time.

Michael's Racing Machine is part of the *I Wonder Why* book series, written to ignite the curiosity of children in grades K-6 while encouraging them to become avid readers. These books explore the marvels of light, color, machines, sound, and other phenomena related to physical science. Included in each volume is a Parent/Teacher Handbook with coordinating activities. The *I Wonder Why* series is written by an award-winning science educator and published by NSTA Kids, a division of NSTA Press.

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