



NATIONAL  
GEOGRAPHIC  
KIDS

LITTLE KIDS  
**FIRST  
BIG**  
BOOK OF  
SCIENCE

Kathleen Weidner Zoehfeld





A large dinosaur skeleton is the central focus of the image, displayed in a museum setting. Three children are leaning on a railing in the foreground, looking at the skeleton. The museum has high ceilings and large windows. The text 'LITTLE KIDS FIRST BIG BOOK OF SCIENCE' is overlaid on the right side of the image.

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WASHINGTON, D.C.

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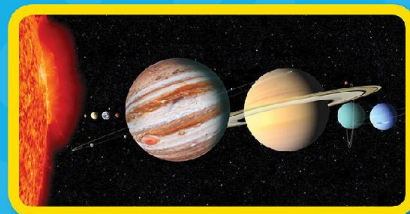


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# INTRODUCTION

In these pages, young readers get an exciting tour of the main branches of science. The questions scientists ask are much like the questions children ask every day. This book shows kids how scientists go about finding answers. Activities sprinkled throughout encourage readers to keep a science journal and bring some science experiments of their own.

**CHAPTER ONE** provides an introduction to science and the scientific process. A simple example shows kids that they already think like scientists as they observe their world, ask questions, come up with hypotheses, and look for answers.

**CHAPTER TWO** focuses on the life sciences. Readers see biologists, botanists, and zoologists at work, observing Earth's amazing variety of animals and plants.

**CHAPTER THREE** explores all aspects of planet Earth—from the rocks beneath our feet to the clouds in the sky above. It shows

astronomers learning about other planets, oceanographers diving into the sea, and geologists delving into mysteries deep inside the Earth.

**CHAPTER FOUR** is about the material world that kids experience all around them. Here they learn how chemists mix substances to make new substances and how physicists observe the way things move.

**CHAPTER FIVE** takes a look at how engineers use knowledge from all branches of science to solve problems and create useful inventions.

# HOW TO USE THIS BOOK

Colorful **PHOTOGRAPHS** illustrate science and scientists in action on each spread.

**POP-UP FACTS** sprinkled throughout provide additional information about the main text.



**FACT BOXES** help young readers learn the names of the main branches of science, the types of scientists who work in those fields, and what aspects of the world they study.

Interactive **QUESTIONS** in each chapter encourage conversation related to the main topics.

**MORE FOR PARENTS** in the back of the book offers parent tips that include fun activities that encourage kids to think like scientists. There's also a helpful glossary.



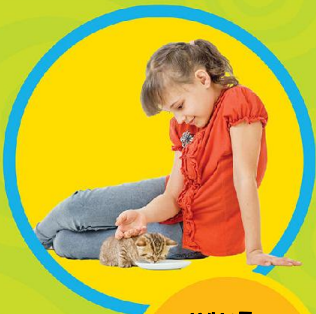
## CHAPTER 1

# WHAT IS SCIENCE?

This chapter introduces you to the way scientists observe and think about the world and how they go about finding answers. Read on to find out how you can be a scientist, too.

# ASKING QUESTIONS

Science is a special way of learning about the world. If you wonder about the world and ask a lot of questions, you are already thinking like a scientist! Some questions are easy to answer. Others are hard. But science can help answer almost any question you ask.



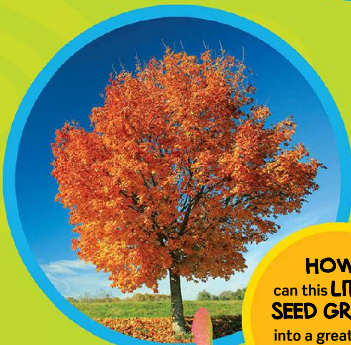
WHAT  
does my  
**KITTEN** need  
to **HELP HIM**  
**GROW?**



WILL  
it **RAIN**  
TODAY?

HOW  
can I make my  
**CAR GO**  
**FASTER?**

HOW  
**FAR AWAY**  
is the  
**MOON?**



HOW  
can this **LITTLE**  
**SEED GROW**  
into a great **BIG**  
**TREE?**



# YOUR SENSES

You begin learning when you use **your senses**. You use these senses every day. Scientists call this kind of learning “observation.”

When you observe the world around you, you discover new things. Those new things can lead to a lot of interesting questions.

You use your **EYES** to **SEE**.



You use your **HANDS** to **TOUCH**.

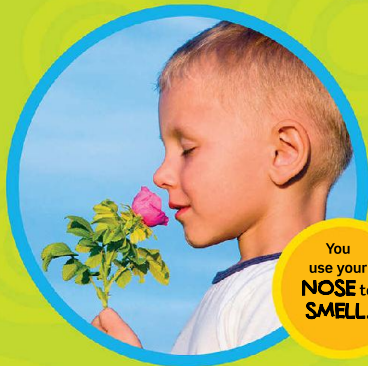


WHAT IS SCIENCE?

You use your **EARS** to **HEAR**.



You use your **NOSE** to **SMELL**.



You use your **TONGUE** to **TASTE**.

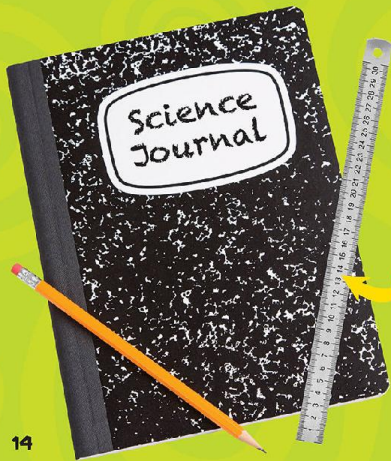




# FINDING ANSWERS

To find answers to questions, scientists follow a few important steps. You can look for answers the same way a scientist does.

Once you have a question, the next step is to think about what the answer might be. You use information and knowledge you already have. You might come up with two or three possible answers—even more. The answer you think is best is your hypothesis.



However, just thinking an answer is right doesn't mean for sure that it is right. A scientist takes another step. She must *prove* that her answer is right. To do that, she sets up an experiment.

An **EXPERIMENT** is a kind of **TEST** that shows whether a **HYPOTHESIS** is correct.

## WHAT IS SCIENCE?



**SCIENTISTS** use tools such as **RULERS** and **SCALES** to find out exactly how **LONG** or how **HEAVY** something is.

GUINEA PIGS



As part of her experiment, a scientist may need to keep track of how much bigger one of her guinea pigs is than the other. She uses a ruler to measure them from snout to tail. When a scientist does an experiment, she keeps track of all her observations in her science journal.

# KEEPING A JOURNAL

When you do your own experiments, you can write notes or draw pictures in a science journal, too. That way you can show others what you did and what you learned.



Something that **CAN BE CHANGED** in an experiment (such as how much sugar you use) is called a **VARIABLE**.

## Science Journal

**What I Observed:** I mixed lemon juice with water to make lemonade. It is very sour. Yuck!

**My Big Question:** How can I make my lemonade sweeter?

**My Hypothesis:** Sugar is sweet. If I add sugar, I think the lemonade will taste sweeter.

### My Experiment:

1. I poured one cup of lemonade into a glass and the exact same amount into another glass.
2. I stirred one teaspoon of sugar into one glass of lemonade.



MEASURING SPOONS

3. I tasted the lemonade in each glass to compare the lemonade without sugar to the one with sugar.

**What Happened:** The lemonade with sugar was sweeter than the lemonade without sugar.

**What I Learned:** Sugar makes lemonade sweet.

**My Next Question Is:** What would happen if I added two teaspoons of sugar to the lemonade?



MEASURING CUPS

## WHAT IS SCIENCE?

The glass of lemonade with **NO ADDED** sugar is called a **CONTROL**. A control is the part of an experiment that stays **UNCHANGED**.

# SHARING WHAT YOU LEARN

When your experiment is done, it's fun to share your new knowledge. If one of your friends doesn't believe that adding sugar made the lemonade taste so delicious, you can show her your experiment. She can also do the experiment herself. If she gets the same result, it means your hypothesis is probably right.

Other friends can try the experiment, too. The more people who try your experiment and tell you that the sugar made the lemonade sweeter, the more certain you can be about your hypothesis.



In **SCIENCE**, a **HYPOTHESIS** that has been tested and accepted is called a **THEORY**.



**SALT**

## WHAT IS SCIENCE?

Other scientists may come up with different hypotheses. One person might think salt will make lemonade sweeter. Another may want to try honey. If you do an experiment and your hypothesis turns out to be wrong, don't worry! That just means you've learned something important: You've discovered one thing that doesn't work.

All the weights and other **MEASUREMENTS** a scientist **WRITES DOWN** while doing an experiment are called **DATA**.

**HONEY**



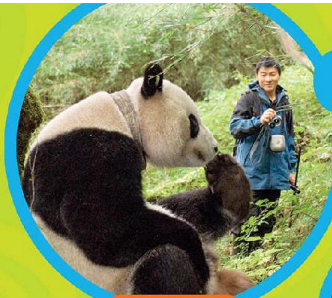
# KINDS OF SCIENTISTS

The world is a very big place, filled with many interesting things to do and amazing places to explore. It takes a lot of different kinds of scientists to study all the different parts of the natural world. Here are just a few.



CHEMIST

VOLCANOLOGIST

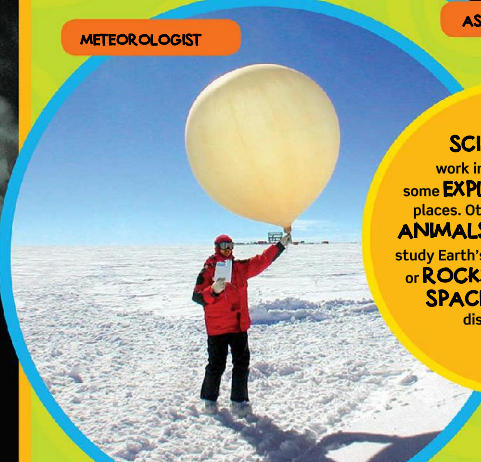


ZOOLOGIST



ASTRONOMER

METEOROLOGIST



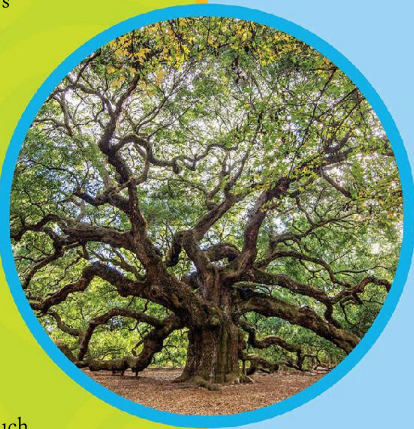
Some **SCIENTISTS** work in **LABS**, and some **EXPLORE** dangerous places. Others learn about **ANIMALS** or **PLANTS**, or study Earth's **AIR**, **WATER**, or **ROCKS**. Some look into **SPACE** to make new discoveries.

If you could spend a day with one of these scientists, who would you choose?

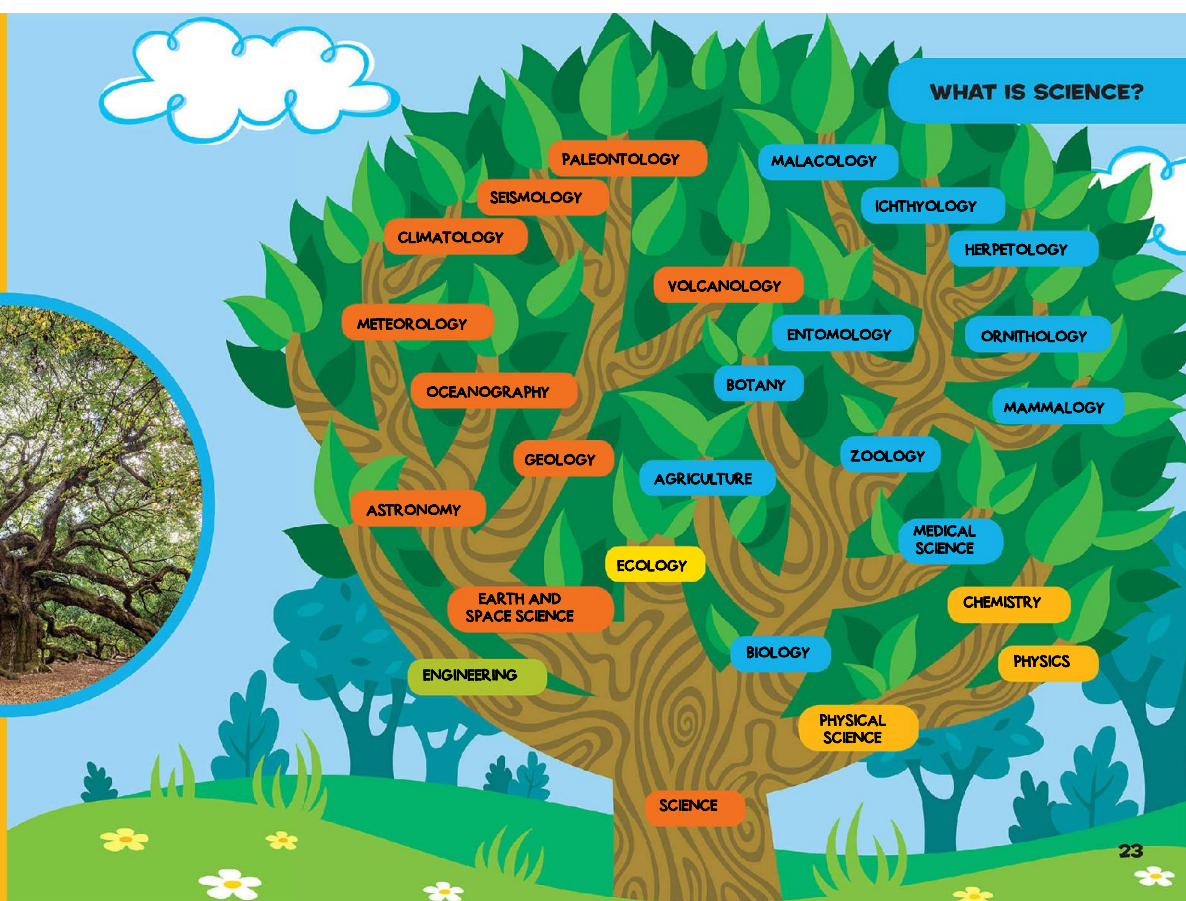
# BRANCHES OF SCIENCE

Think of science as a tree. Imagine that science is the trunk of the tree. The tree's branches represent the many kinds of science that exist.

One of the main branches of the tree is for all living things: **BIOLOGY**. Coming from that is a branch that deals with animals: **ZOOLOGY**. Off of that branch are smaller branches that represent the different animal sciences.



For example, there is a branch for insects, and another for birds. Each of these branches of science has a name, such as entomology for insects and ornithology for birds. You'll discover what the other names mean as you read this book.



# WORLD OF KNOWLEDGE

By asking questions and then using scientific observation and experimentation, scientists have made a lot of great discoveries. When scientists find answers to big questions, the answers become part of our knowledge.

The space shuttle **DISCOVERY** blasted off into space using **ROCKET POWER**.



Scientific knowledge makes it possible to fly in spaceships, drive cars, talk on the phone, play video games, use a computer, keep animals and people safe and healthy, grow good food, and much more.

Veterinarians **TAKE CARE** of all kinds of animals, from **DOGS** and **CATS** to **BIRDS** and **HORSES**.



VETERINARIAN

## WHAT IS SCIENCE?

Anyone can be a scientist and discover new things. Let's find out more about the different kinds of science, what scientists do, and all the amazing things they wonder about and learn.



## CHAPTER 2

# LIFE SCIENCE

Plants, animals, and people—Earth is filled with an amazing variety of living things. In this chapter, you will learn about the many different kinds of life scientists.