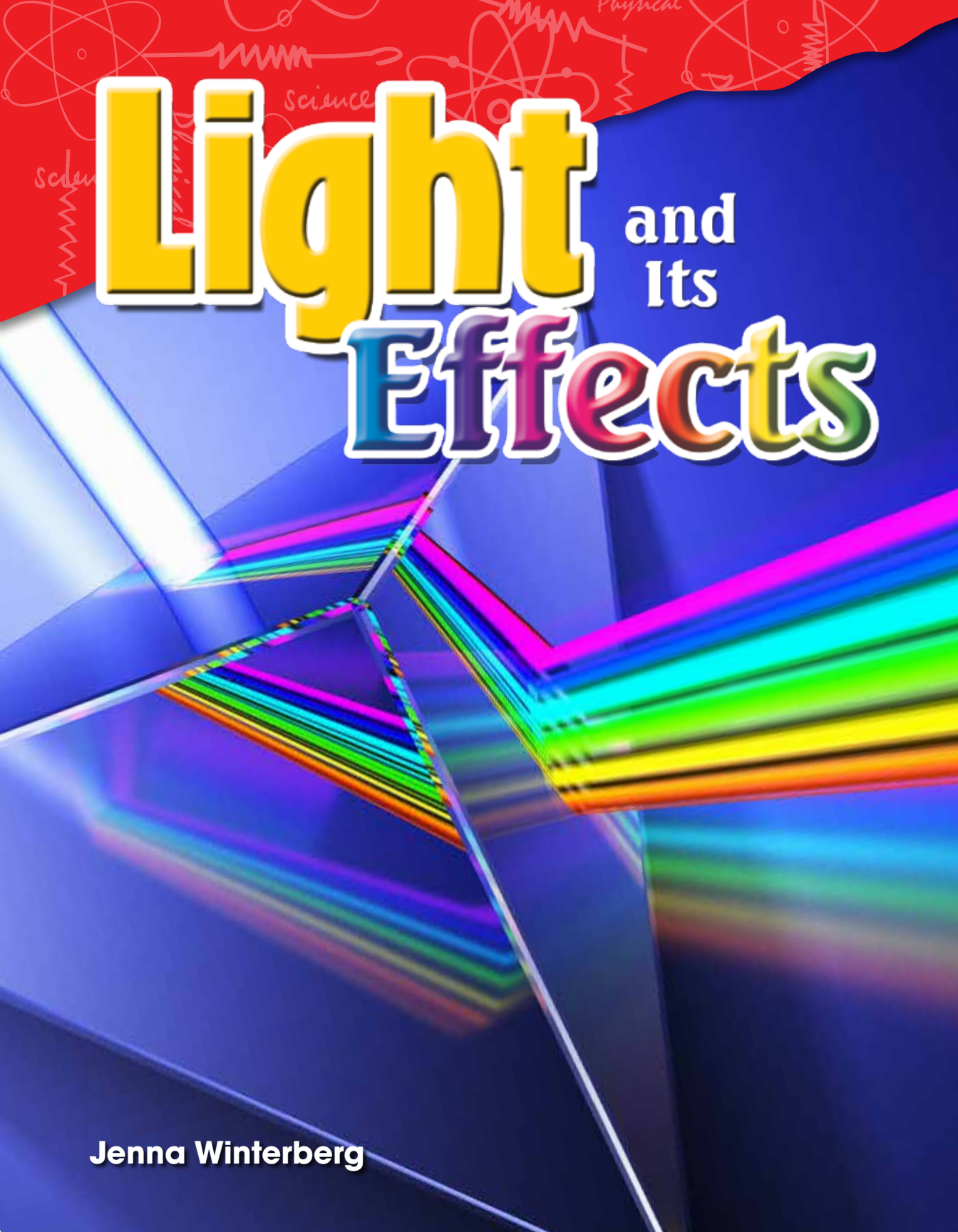
Light and Its Effects



Jenna Winterberg

For teachers' inspection ONLY

Table of Contents

Light in the Universe 4

Waves of Light 6

Traveling Light 10

What Do You See? 16

Particles of Light. 22

Power of Light 26

Think Like a Scientist 28

Glossary 30

Index 31

Your Turn! 32

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Light in the Universe

We wake up when light streams through our windows in the morning. We know our day will wind down after sunset. We turn on the lights first thing in the morning, turning them off only when our day is done. So, of course, we know what light is.

At least, we assume we know what light is. But ask yourself, "What makes up light?"

Most things in the universe are made up of **matter**. Matter is made up of tiny particles called *atoms*. Light can behave just like one of these particles. But light isn't matter, and it doesn't always work like a particle, either. Instead, it acts like a wave.

Light is a special form of energy. It can move faster than anything else in the universe. It can travel in a straight path, or it can bend and turn. And it can even pass through objects.

Even though we think we understand light because it's all around us, there's a lot more to it than meets the eye.

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History of Sight

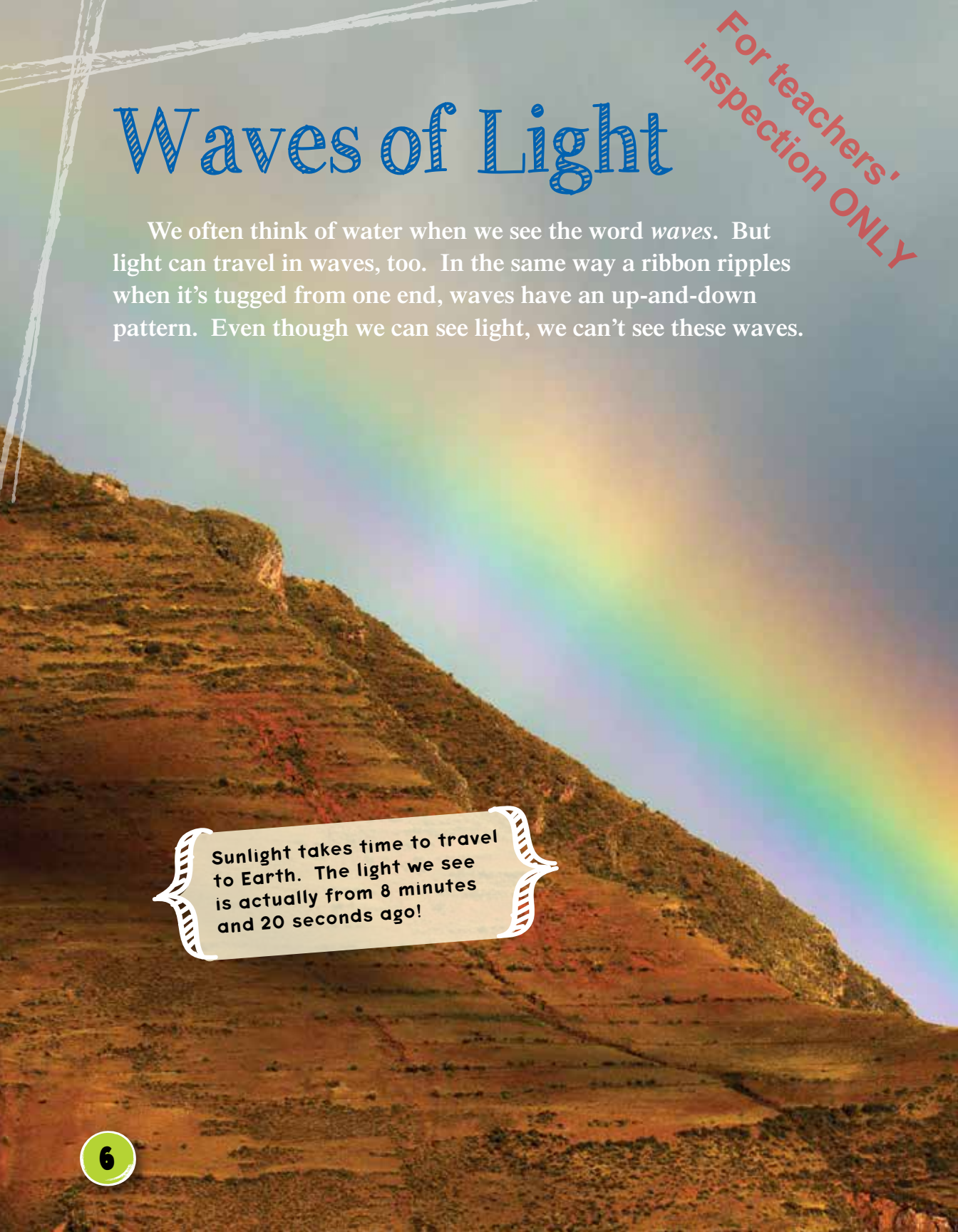
In the past, many people believed that sight came from light that was shining out of the eyes. It was called the *emission theory*. It wasn't until the eleventh century that this theory changed. When a scientist named Ibn al-Haytham published his findings, people finally started to understand the truth about sight. He said that light reflects off objects and goes into the eyes to create sight.



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Waves of Light

We often think of water when we see the word *waves*. But light can travel in waves, too. In the same way a ribbon ripples when it's tugged from one end, waves have an up-and-down pattern. Even though we can see light, we can't see these waves.



Sunlight takes time to travel to Earth. The light we see is actually from 8 minutes and 20 seconds ago!

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Light

We don't think of light as having much of an appearance. That's because **white light**, like the light the sun gives off, seems colorless. In truth, white light contains a spectrum, or range, of colors. If you were to break it up to see all of its parts, you would find a rainbow of color. It contains red, orange, yellow, green, blue, indigo, and violet!

When we observe light, we're really observing electromagnetic radiation. Light has wavelengths that we can see. A wavelength is the measure of distance between two peaks of the same wave. Of all the colors that make up the **visible spectrum**, red has the longest wavelength. Violet has the shortest. But visible light is just a small part of a range we call the *electromagnetic spectrum*. We can't see the other wavelengths in this range, but we can observe them.

Indoor Rainbow

To split light into a visible spectrum, fill a container with water. Then, move it into a sunlit window. Place a small mirror in the water, and angle it toward the sun. A rainbow will appear on the wall!

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Think Like a Scientist

How does refraction change the appearance of things? Experiment and find out!

What to Get

- clear glass jar with lid
- magazine
- magnifying glass
- water

