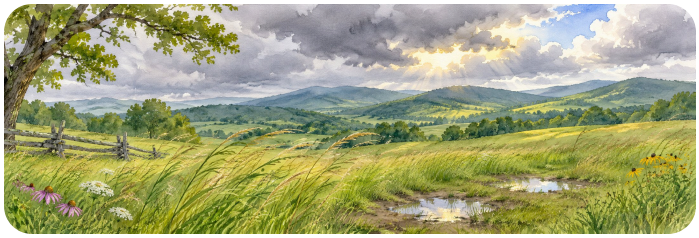
CARDINAL COMPASS - NO. 7 - HANDS-ON LEARNING - WITH CARL THE CARDINAL

Weather Lab

VOL. 7

Feel the push of the air, measure the wind, and spin a tiny storm in a bottle. And three experiments you can do safely at home.

You cannot see the air moving. But you can measure it, if you build the right tools. That is what weather watchers do.



Cover illustration: storm clouds gather over the hills, sunbeams break through, the wind bends the grass, and puddles shine on the ground. Weather is happening in this picture, all at once.

Read together	Build together	Grown-up with you for every experiment



Meet Carl - Weather Carl

Carl the Cardinal is your guide. For this project, he wears a yellow raincoat and keeps a weather station, with spinning wind cups to measure the breeze. His green neckerchief and gold compass medallion stay on. Color your own Carl on the last page.

How to use this book: Pages 2-4 tell the story. Page 5 is safety. Read it first, and read it well. This unit has the most important safety page in the series. Then build the three instruments. Finish with the week-long weather log and the questions. Color Carl at the end.

Keep a notebook near you. Write what you guess. Write what you see.

You will need, for all three experiments: a wide clear jar, a balloon, scissors, a rubber band, a straw, tape, a card, four small paper cups, two sticks or sturdy straws, a pushpin, a pencil with an eraser (or a cork), a crayon, two matching 2-liter plastic soda bottles, a tornado tube connector that joins them mouth to mouth, water, strong tape (grown-up only, fallback seal if no connector), the rain gauge from Unit 5, a timer, a notebook, and a pencil.

Science - Volume 7 - Version 7

What is weather made of?

Weather is what the air is doing today. Is it warm or cold? Wet or dry? Still or blowing? The air seems like nothing. You walk right through it. But air is real stuff, and it pushes, and it moves. Two big ideas run this whole unit: the push of the air, and the air on the move.

Air pressure: air pressure is the push of the air all around us. Air has weight, and it presses on everything, on the ground, on your hands, on the top of a jar. You do not feel it, because it pushes from every side at once.

Wind: wind is air on the move. Air flows from places where it pushes harder toward places where it pushes less, the way water flows downhill. That flowing is the wind you feel on your face.

Barometer: a barometer is a tool that measures the push of the air. When the push changes, weather is often on its way.

Anemometer: an anemometer is a tool that measures how fast the wind blows. The spinning cups on Carl's weather station are an anemometer.

Forecast: a forecast is a careful guess about coming weather, made from measurements. A forecast is not a promise. It is the best guess the measurements can give.

Why measuring comes first

Nobody can watch air pressure with their eyes. Nobody can count the speed of the wind by looking at trees. So weather watchers build tools. The tools turn invisible things into things you can see: a pointer that rises and falls, and cups that spin faster and slower.

Then they write the numbers down, day after day. The writing is not extra work. The writing is the science. One reading tells you about today. A week of readings starts to tell you what is coming.

Your weather station

By the end of this unit you will have three weather tools of your own: a barometer for the push of the air, an anemometer for the wind, and the rain gauge you built in Unit 5 for the rain. That is a real weather station, small but real. Weather watchers long ago started with tools just like these.

One station is only one town

Your station tells the truth about one place: your yard. But weather travels. Rain that soaks a town to the west of you this morning may reach you by evening, and your instruments alone cannot see it coming until the air above your own yard begins to change.

That is why weather watchers have always shared what they measure. A report from one town is a fact about that town. Reports from many towns, laid side by side, show weather on the move. Page 4 tells how that sharing grew. Later in this book, on page 12, you will practice the hardest part of forecasting: deciding what to do when your own clues disagree.