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How Scientists Use Satellites and Balloons to Study the Atmosphere

Have you ever wondered how scientists learn what's happening high up in the sky? Since people can't just climb into the atmosphere to take notes, scientists use special tools to explore the air above Earth. Two of the most important tools are weather balloons and satellites.

Weather balloons are launched from the ground and can rise high into the stratosphere, the second layer of the atmosphere. These balloons carry instruments that measure temperature, humidity, and air pressure as they float up. They send this data back to Earth using tiny radios. This helps scientists understand what the weather is doing and how it might change. These balloons are used every day around the world.

But balloons can only go so high. To study the upper layers, like the mesosphere and thermosphere, scientists use satellites. Satellites are machines that orbit Earth far above the atmosphere. They can take pictures, measure gases, and even watch how winds move in space. Some satellites look at weather patterns, while others track things like wildfires, pollution, or changes in Earth's climate.

Different layers of the atmosphere have different jobs. For example, the troposphere, the lowest layer, is where all the weather happens. The stratosphere contains the ozone layer, which protects us from harmful sunlight. Higher up, the mesosphere and thermosphere are harder to reach, but they're important, too. The auroras, or northern and southern lights, happen in the thermosphere.

Satellites and balloons help scientists learn how these layers work together. They collect data that can help predict storms, prepare for natural disasters, and protect airplanes and spacecraft. Without these tools, it would be much harder to understand our skies.

Thanks to balloons and satellites, we know more about the atmosphere than ever before. These tools are like space detectives, helping us study parts of Earth we can't touch. As technology improves, scientists will keep learning even more about our amazing sky.