Water plays a major role in weather, despite making up such a small fraction of the atmosphere. In some areas, the local atmosphere may contain as much as 4 percent water, while other regions have no atmospheric water at all. As water can exist as a solid, liquid or gas under normal atmospheric conditions, it participates in the hydrologic cycle. In this cycle, water evaporates from the ocean in the form of water vapor and eventually returns to land and sea in the form of precipitation.

You can't see water vapor, but it quickly becomes visible when it cools and condenses against something. If you've ever noticed moisture beads on the windows of a warm car on a cold day, you've seen condensation in action. Warm air vapor touches the cold window and the vapor turns back to a liquid. Clouds form along similar lines. The atmosphere is full of tiny dust particles called condensation nuclei, which come from volcanic eruptions, dust storms, fires and pollution. When water vapor condenses, it clings to these microscopic specks. If there's enough cooling water vapor in the air, these accumulate by the trillions to form clouds. If temperatures are cold enough, the water turns to ice around the condensation nuclei.