From an aerodynamic standpoint a glider flies exactly the same way all heavier-than-air aircraft do. The wings of a glider turn (deflect) the air through which they're moving, producing the reactive force of lift which supports the glider. (Huh? It's not like that, you say? Actually it is...and many popular theories about lift are incorrect. But the devil is in the details, and exactly *how* turning occurs is a contentious subject even today.)

The paradox is that the glider needs to keep moving to produce lift, and this movement is provided by gravity. In effect the glider is continually "falling" forward; this falling creates airflow over the wings which produce lift, and the glider stays airborne.

It's an irony of soaring that the same force pulling the glider down is also responsible for keeping it aloft.

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So how does a glider stay up without an engine?

By using rising currents of air in the atmosphere, called lift (not to be confused with the lift produced by a glider's wings). These invisible currents are typically generated by three mechanisms:

- **Thermal lift.** Solar heating of the ground warms the air above it, which then rises in bubbles or columns called thermals. The tops of thermals are often marked by puffy cumulus clouds, a reliable sign to the glider pilot that lift is active.
- **Ridge lift.** Wind blowing perpendicular to a slope is deflected upward, which the glider can use to stay aloft. Flights of hundreds of miles along the Appalachians are made in this manner.
- **Wave lift.** Wind blowing over mountains sometimes results in "ripples" in the atmosphere, as the wind compresses and rebounds after passing over them. These ripples, or waves, can extend high into the atmosphere. Flights over 20,000 feet in wave lift are not uncommon.