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High Altitude Experiments[1] SHANE MAYER-GAWLIK, JOANNA GORDON, FORT LEWIS COLLEGE/COLORADO SPACE GRANT CONSORTIUM TEAM — Carried by a weather balloon to 95,000 ft and back, our instruments recorded temperature, pressure, and acceleration. The acceleration data was collected to demonstrate the deviation from 9.8 m/s2 in Earth's gravity at high altitude. The change in acceleration due to gravity is expected to be about 0.02 m/s2. The Equivalence Principle of general relativity presents a challenge in measuring this quantity. There is no way to tell whether the accelerometer is measuring change in velocity or a gravitational field. Temperature and barometric pressure data were collected in order to study the thermodynamic properties of air. In addition, we calculated sound speed as a function of altitude based on this thermodynamic data, under the assumption of ideal gas behavior.

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Shane Mayer-Gawlik

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