The relationship between altitude and atmospheric pressure (measured in hPa, or hectopascals) is **inversely proportional**: as altitude increases, the atmospheric pressure decreases. This happens because the higher you go, the less air is above you, resulting in less pressure.

Approximate Relationship Between Altitude and hPa:

Altitude (meters)	**Pressure** (hPa)	Description
Sea Level	1013.25	Standard atmospheric pressure at sea level.
500	~954	Small drop in pressure, noticeable in high hills.
1,000	~899	Typical pressure at small mountains.
2,000	~795	Found in high-altitude cities like Bogotá.
3,000	~701	Pressure at high mountains.
5,000	~540	Near the base of Mount Everest.
8,848 (Everest Summit)	~337	Extremely low pressure at Everest's peak.
10,000	~265	Close to the limits for oxygen use.

Key Points:

1. **Sea Level Standard:** At sea level, the atmospheric pressure is about **1013.25 hPa**. This is the reference pressure used for weather forecasts and standard calculations.
2. **Decrease in Pressure:**
    - The pressure drops by about **12 hPa for every 100 meters** of ascent near sea level.
    - The rate of decrease slows as altitude increases due to the thinning of the atmosphere.
3. **Why Lower hPa at Higher Altitudes?**
    - At higher altitudes, there is less air mass above you, so the weight (and thus the pressure) of the air is reduced.
4. **Applications of Altitude and Pressure Relationship:**
    - **Aviation:** Aircraft rely on barometric pressure for altimeter readings to determine altitude.
    - **Weather Forecasting:** Pressure trends indicate weather changes; high pressure is associated with clear skies, while low pressure often brings storms.

Formula for Altitude From Pressure:

You can calculate altitude based on pressure using the following formula:

$$h = \left(1 - \left(\frac{P}{P_0}\right)^{\frac{1}{5.257}}\right) * T_0 * \frac{1}{0.0065}$$

Where:

- h = Altitude in meters.
- P = Measured pressure in hPa.
- P_0 = Sea-level pressure (1013.25 hPa).
- T_0 = Standard temperature at sea level (288.15 K).
- .0065 = Temperature lapse rate in K/m.

Conclusion:

Yes, the higher you go, the lower the pressure in hPa. This relationship is critical in many fields, including aviation, meteorology, and mountaineering, and is a fundamental aspect of the BMP180 sensor's functionality for determining altitude.

New Way to Think About Pressure & Density Altitude | Aircraft Performance Explained