The relationship between temperature and air pressure

By : Jana Mohammed Alkubydan

Tenth intermediate school

Sakaka Aljouf

Teacher : Mrs. Eman Ibrahim Alwaked

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Content :

Abstract:

The relationship between heat of temperature at atmospheric pressure. Atmospheric pressure, air pressure, or barometric pressure changes constantly as a result of changes in temperature, which affects the air density and is related to it.

Research Question and Hypothesis:

This study explains the relationship between temperature and air pressure.

- Why does the temperature decrease as we rise above the surface of the earth ?

Some people may think that as we rise above the surface of the earth, we approach the sun and its radiation warms the air… but at the top of Mount Everest at an altitude of 8848 meters, the temperature reaches 42,5 degrees below zero!

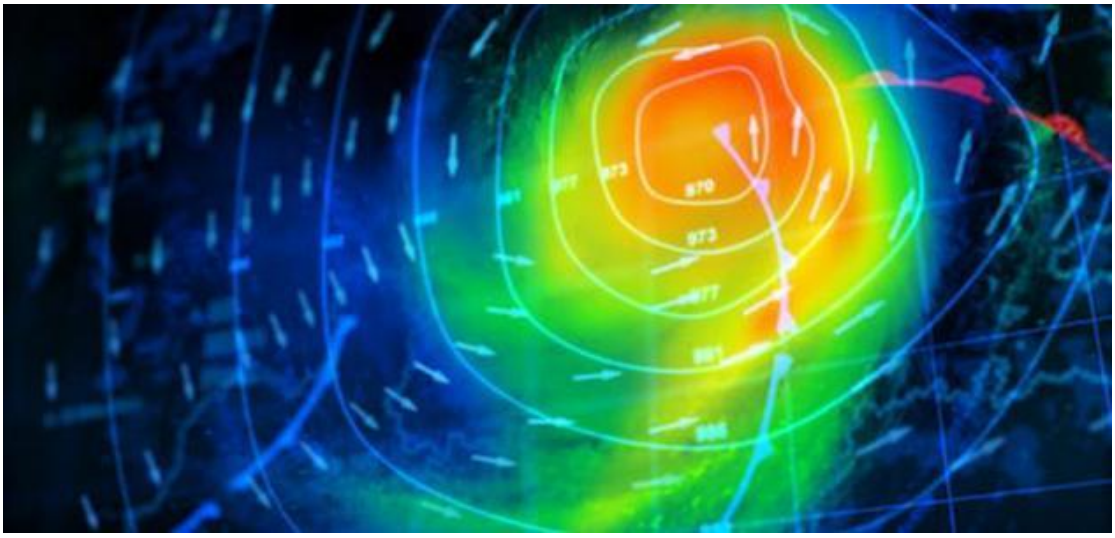

Figure 1. The relationship between heat at atmospheric pressure.

We noticed a clear change in air pressure levels when moving from winter to summer, which sparked curiosity to know and study the relationship between air pressure and air temperature.

Materials and Methods:

- I took observations during February Month.
- I was particularly interested in watching for how does the atmospheric pressure change relative to temperature.
- We have in our school devices for measuring air temperature.
- I used our data for writing my research.

Figure 2. Atmospheric pressure device.

Figure 3. Air temperature device.

Data Summary and Analysis:

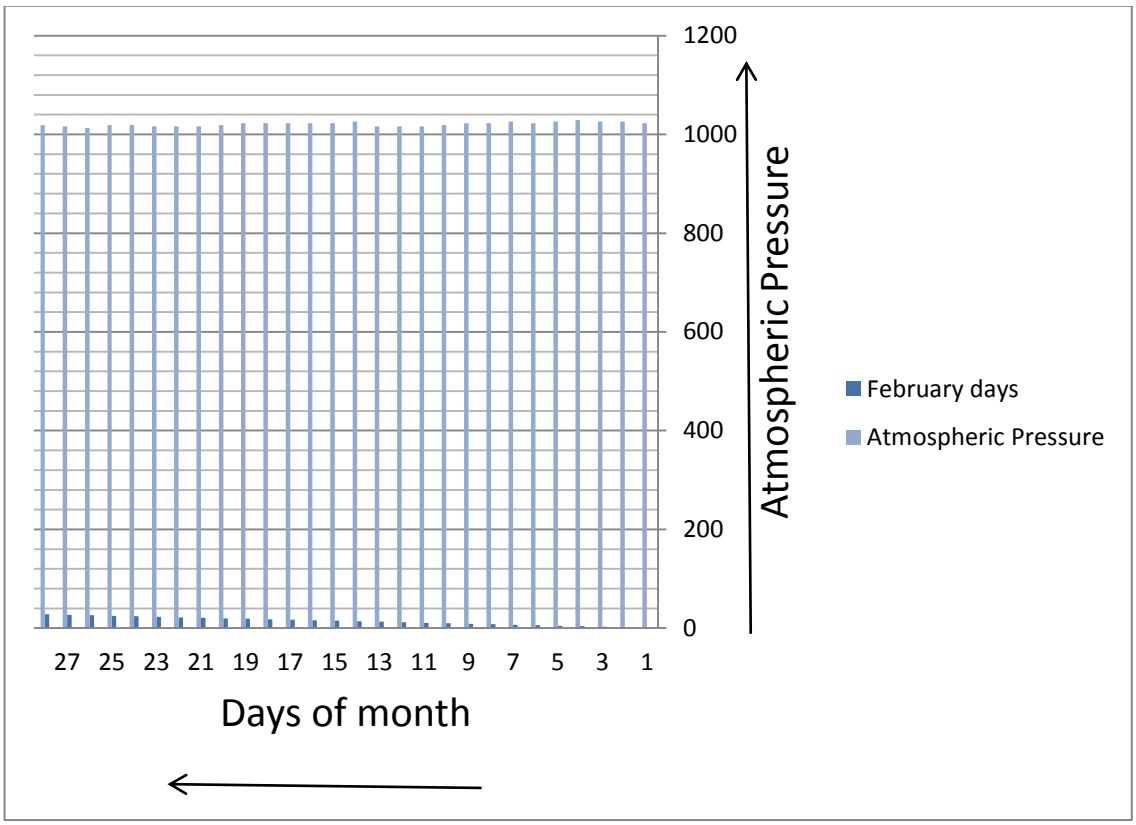

Figure 4. The graph shows the difference in atmospheric pressure during February.

Results, Conclusions, and Discussion:

- Atmospheric pressure changes constantly as a result of changes in temperature, which affects and is associated with air density.

-The relationship between atmospheric pressure and high temperature causes hot air to rise air pressure, since when air particles collide they strongly affect each other, and when air molecules heat up they move faster and this increase in speed leads to more collisions, and produces for this, a stronger force acting on the particles increases the atmospheric pressure, and the temperature affects the value of the air pressure in relation to the height due to the variation in the air density value. For example, in the case of the presence of two air columns that are exposed to different temperatures, the hotter column will test the same value of the air pressure at a greater height which it is in lower height an d in the case of a colder air column.

-The relationship between atmospheric pressure and low temperature: low heat leads to a decrease in the value of atmospheric pressure, as the lower temperature of gases molecules slows down their movement, and low speed results in fewer collisions between molecules, which reduces the value of air pressure, and air density plays a role in the relationship between heat and pressure, because hotter air is less dense compared to the cooler air, which allows molecules in hot air to have more space to collide with more force, but in hot air the molecules are closer to each other and therefore it produces collisions less air, less air pressure.

-Atmospheric pressure value, It is not possible to refer to the value of atmospheric pressure or air pressure as a regular or specific digital value, because the value of air pressure is not regular and varies depending on the location of the earth's surface: it ranges from 980 to 1050 millibars, and this value varies depends on the height from the surface of the earth, so if we rise from the surface of the earth, the value of air pressure will be lower, and this is because the air particles decrease, the higher the height, which reduce the density of air and thus leads to a decrease in the value of pressure, and therefore, the highest value of atmospheric pressure on earth's surface is at a level Sea surfaces, and because the air density is the largest possible.

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Thanks

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