Module 2
Lesson 2.1
1 hour

Pressure, Temperature & Volume

Definitions
Relationships

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Definitions

Pressure
Temperature
Volume

https://www.mathsisfun.com/definitions/volume.html
https://education.nationalgeographic.org/resource/temperature
https://www.bbc.co.uk/bitesize/topics/z4tbrd2p/articles/zb5dydm

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Pressure

How much force is acting on one area.

Pressure = Force ÷ Area

Reduce the area and/or increase the force to create more pressure

- Pascal = one newton per square metre
- PSI = Pound force per square inch

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More Force

4

Less Area

5

Temperature

The degree of hotness or coldness of an object.

How much heat/energy an object has.

Water boils at:

- Celsius 100°
- Fahrenheit 212°
- Kelvin 373.15°

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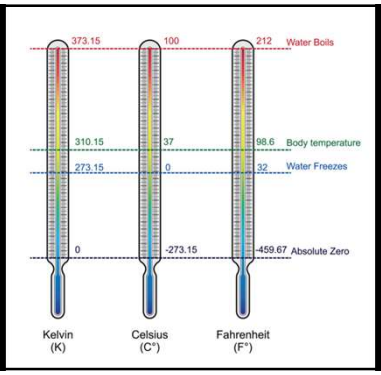

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Volume

The amount of space something takes up (3D).

E.g. A “20 ft” shipping container
Internal dimensions in metres: 5.898 x 2.352 x 2.393
Volume = 33.196 m^3

Usable capacity = 32.6m^3

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Question for Discussion

Why is the usable capacity of a container not it’s volume?

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Relationships

Pressure and Volume

Temperature and Volume

Pressure and Temperature

https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Supplemental_Modules_(Physical_and_Theoretical_Chemistry)/Physical_Properties_of_Matter/States_of_Matter/Properties_of_Gases/Gas_Laws/Gas_Laws%3A_Overview

https://chemistrytalk.org/gay-lussacs-law/

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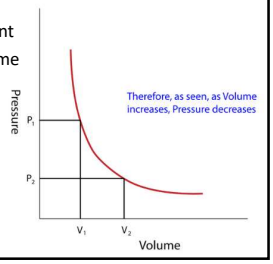
Pressure and Volume

- Boyle's Law:
- Temperature and amount of gas is constant
- Pressure is inversely proportional to volume

- As volume increases, pressure decreases
- As pressure increases, volume decreases



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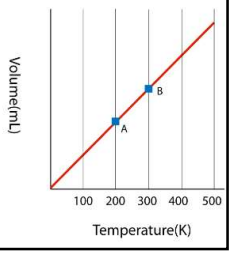
Temperature and Volume

- Charles' Law
- Pressure and amount of gas is constant
- Volume is directly proportional to temperature

- As temperature increases, volume increases
- As volume increases, temperature increases



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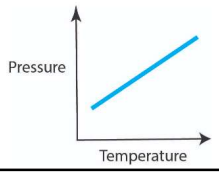
Pressure and Temperature

- Gay-Lussac's Law
- Volume and amount of gas is constant
- The pressure is directly proportional to the temperature

- As pressure increases, temperature increases
- As temperature increases, pressure increases



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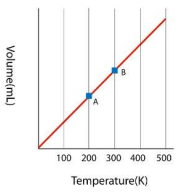

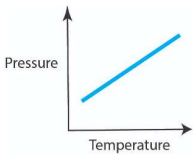

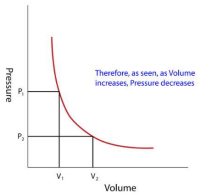

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Question for Discussion

What happens to the temperature of a bike pump as the tyre inflates?

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Recap and Questions

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