**GAS LAWS SUMMARY**

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| **1. Pressure and Temperature** | | | (\*\*Volume constant, mass constant) | | | | |
|  | | | | [Image result for pressure temperature 0C graph](http://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwiykdyI5eTSAhVJDcAKHfWpBSoQjRwIBw&url=http://www.bbc.co.uk/education/guides/zjc6fg8/revision/2&bvm=bv.149760088,d.ZGg&psig=AFQjCNErMVVNR3d5sSzdodJbBEQOzN0nAg&ust=1490089211134170) | [Related image](http://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwifxoTq5OTSAhXGPRQKHR0rBxUQjRwIBw&url=http://dos222.blogspot.com/2013/05/blog-post.html&psig=AFQjCNFiNbKwioI-pzfzYrZLObAEU5f_tA&ust=1490089114321386) | | **\*\* TEMP MUST BE IN KELVIN** |
| **Kinetic theory**  **- Temp ↑ particles have greater speed, and greater Ek**  **- Particles collide with container walls more often and with greater Force, - since P = F/A, Pressure ↑** | | | | | | | |
| [https://www.patana.ac.th/secondary/science/anrophysics/unit5/images/charles_law_app.png](https://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwilkbfJ-LDMAhWB8RQKHXuGCC8QjRwIBw&url=https://www.patana.ac.th/secondary/science/anrophysics/unit5/commentary.htm&bvm=bv.120853415,d.d24&psig=AFQjCNHjaa4EIBaBpk2SRPGFkVGKw6yYiQ&ust=1461919419096676)**2. Volume and Temperature** | | | (\*\*Pressure constant, mass constant) | | | | |
|  | | [Image result for volume temperature](http://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwjki_SZ5eTSAhUpDMAKHdwGD74QjRwIBw&url=http://qap.everythingmaths.co.za/science/grade-11/07-ideal-gases/07-ideal-gases-03.cnxmlplus&bvm=bv.149760088,d.ZGg&psig=AFQjCNE6rGVR7n7DY0h0NZXfTI2Hf3lWxA&ust=1490089255382099) | | | | **\*\* TEMP MUST BE IN KELVIN** | |
| **Kinetic theory**  **- Volume ↓ particles collide with container walls more often**-  **Overall force increases, - since P = F/A, Pressure ↑** | | | | | | | |
| **3. Pressure and Volume** | (\*\*Temperature constant, mass constant) | | | | | | |
| http://www.schoolphysics.co.uk/age16-19/Thermal%20physics/Gas%20laws/text/Gas_laws/images/1.png | https://i0.wp.com/c2.staticflickr.com/4/3746/32484071303_debe92a388_o.png?resize=392%2C197&ssl=1 | | | | |  | |
| **Kinetic theory**  **- Volume ↓ particles collide with container walls more often**  - **Overall force increases** **- since P = F/A, Pressure ↑** | | | | | | |
| **Pressure is the force per unit area**  **p : (Pa or Nm-2) F : (N) A : (m2)** | **Combined Gas Equation** | | | | **Degrees Celsius to Kelvin: + 273**  **Kelvin to degrees Celsius: - 273**  **Absolute Zero: -273 oC / 0 K**  **There is no negatives on the kelvin scale**  **Temperature is a measure of the mean kinetic energy of particles** | | |

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| **Specific heat capacity (c)**: Heat energy required to raise the temperature of 1kg of a substance by 1oC | | Specific heat capacity values are different for all materials  – values found in data sheet | |
| *EH = c m ∆T* | | can be used to find heat energy supplied by appliances  Heat energy will usually be lost to the surroundings – not all will be transferred to the substance being heated | |
| EH : Heat energy (J)  c : specific heat capacity (J kg-1 oC-1)  m : mass (kg)  ∆T : change in Temperature (oC) |  |
| **Low specific heat capacity –**  not much energy to heat (heats up quickly for constant power) but loses heat quickly  **High specific heat capacity –**  lots of energy to heat (heats up slowly for constant power) but loses heat slowly (retains heat better) | | | |
| **Specific latent heat (****l)**: Heat energy required to change the state of 1kg of a substance at the same temperature | | Specific latent heat values are different for all materials – values found in data sheet | |
| *EH = m* ***l*** |  | ***Specific Latent heat of fusion,* lf *:***  Solid -> Liquid | |
| EH : heat energy (J)  m : mass (kg) | | ***Specific Latent heat of vaporisation* lv *:***  Liquid -> Gas | |
| **l** : specific latent heat of fusion / vaporisation | | |  |
| The same material **requires different quantities of heat** to change the state of unit mass from **solid to liquid (fusion)** and to change the state of unit mass from **liquid to gas (vaporisation).** | | | |
| Melting  point  boiling  point | | During change of state  – **temperature remains constant** | |
| ***For change of temperature:***  ***EH = c m ∆T*** | |
| ***For change of state:***  ***EH = m l*** | |
| **“specific”= per kilogram** | |