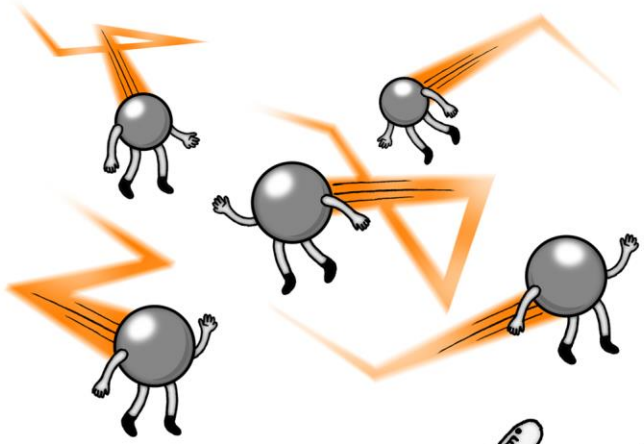
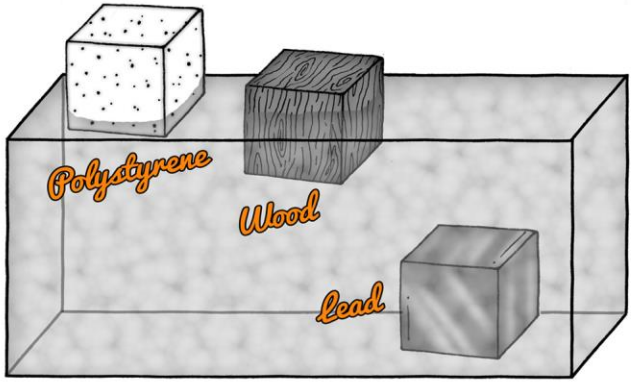
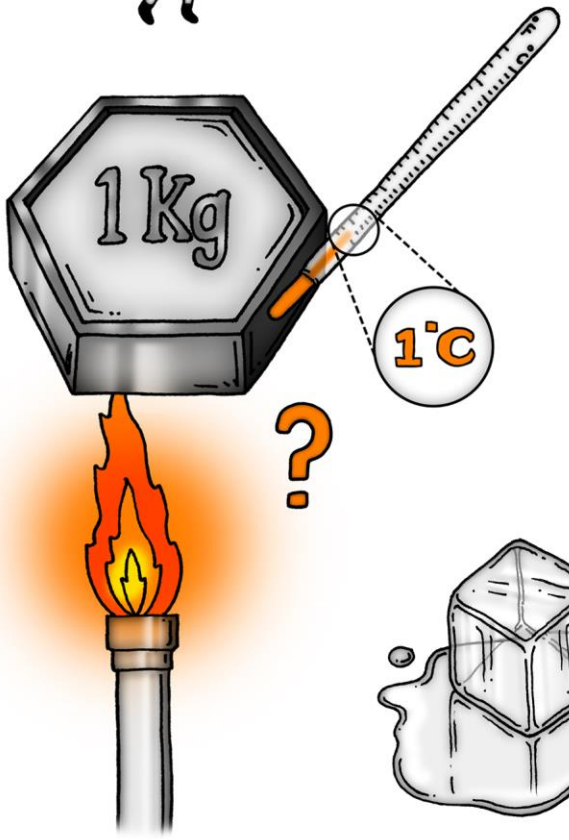
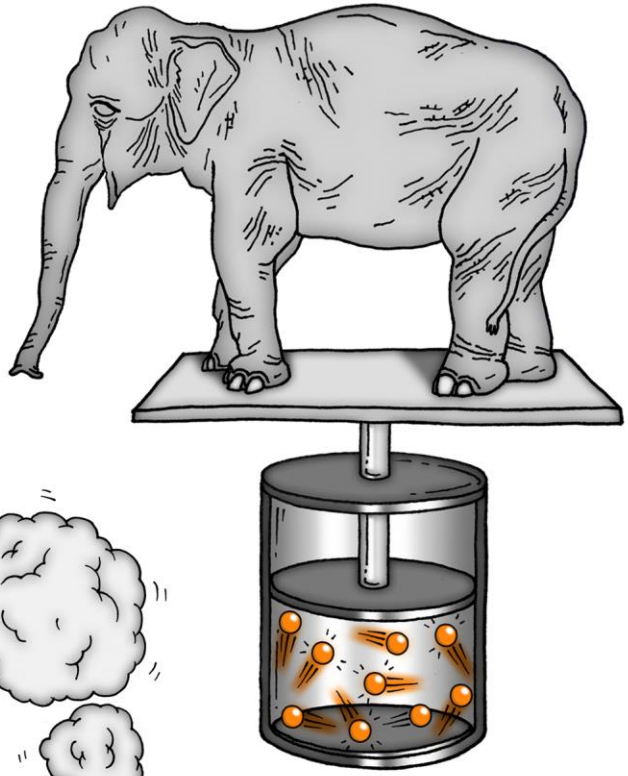
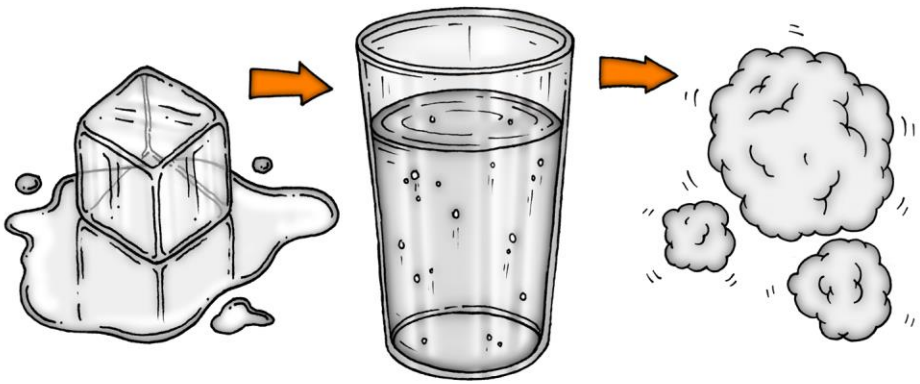




AQA GCSE
PARTICLE MODEL OF MATTER
THINK IT!







Density:

- If you had no weighing scales, how could you determine whether candle wax has a higher or lower density than water?
- If someone gave you a ring and told you it was gold, how could you use density to prove whether it is gold or not?
- Copper has a density of 8.96 g/cm^3. Convert this to kg/m^3.

Temperature change and specific heat capacity:

- Why do you think different substances have different specific heat capacities?
- If a hot piece of metal is put in cold water, what information would you need to be able to determine the final temperature of the system?
- Specific heat capacity uses units of heat and temperature. Compare these two units and try to explain the difference.
- The unit of heat capacity can be J/kg °C or J/kg K. Explain why both can be used even though there is a difference of 273 degrees between °C and Kelvin.

Changes of heat and specific latent heat:

- Find out the conditions necessary for a hot water molecule to break away to become a molecule of steam.
- Which do you think requires more energy, turning 1 kg of ice into water or 1 kg of water into steam. Explain your reasoning.
- Scientists use cooling curves rather than heating curves to determine the melting point of a substance. Why do you think cooling curves are preferred?

States of matter and internal energy:

- If a pan of cold water is filled to the top then heated, it overflows. Try to give a reasoned argument why this happens even though the particles are still next to each other.
- Explain, using the particle model, which states of matter can be compressed and which can not.
- Investigate what Brownian motion is and explain it to a peer.
- Investigate what is meant by kinetic and potential energy of particles in a system.

AQA GCSE Particle model of matter

ThinkIT!

Calculations:

- Write a numerical question and then answer it to show you understand the relationship for specific heat of fusion.
- A shower heater can provide 360,000 J of energy every minute to heat the water flowing through it. If the water needs to be heated by 30 °C, show that the shower can deliver a maximum of 2.86 kg of water in a minute.

Particle motion in gases:

- If you had an open tin can on the moon, sealed it then heated it, what would happen to the pressure inside the can?
- If the particles of a gas with larger molecules had the same kinetic energy as the particles of a gas with smaller molecules, would the temperature of the gases be the same?
- Use a drawing to explain to a peer why hotter particles exert a greater force on a container wall than cooler particles.

Pressure in gases (physics only):

- What evidence is there to suggest that increasing the pressure of a gas produces a net force at right angles to the wall of the container the gas is in?
- Pressure of gases is often given in Pascals. Investigate other units that could be used for gas pressure.
- For a fixed mass of gas, p x v = constant. Try to work out what shape of graph this relationship would give you.

Increasing the pressure of a gas (Physics HT):

- When explaining gas pressure, physicists often refer to using an ideal gas. Explore what an ideal gas is and why it is used to explain the behaviour of gases.
- Gases can do work either by expanding or contracting. Investigate how you would show whether a gas has expanded or contracted when looking at the solution to a calculation.