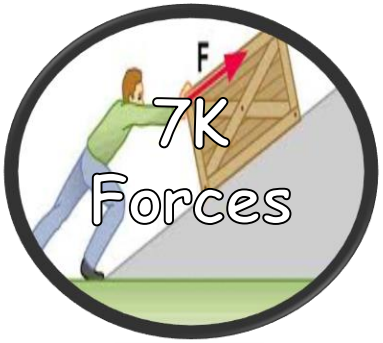
Knowledge Based Learning
Tests and Answers



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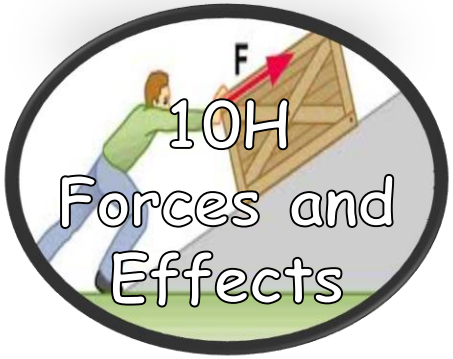


7I - Energy

1. State the unit of energy
2. Name the law that says energy is not created or destroyed, just transferred.
3. State a substance that is used as a source of energy.
4. State what is the ultimate source of the energy in wind energy.
5. State which colour is the best and which is the poorest absorber of heat.
6. Give one example of a renewable or a non-renewable energy source.
7. State a disadvantages of fossil fuels.
8. State a way in which energy can be transferred.
9. Keyword: the amount of useful energy transferred.
10. State the energy type in objects under strain.
11. State the energy type in hot objects
12. Keyword: A type of energy resource that cannot run out.
13. State the energy stored in objects in a high position
14. State an advantage of fossil fuels.
15. State a factor that makes up a good fuel.

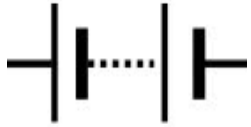
7I - Energy

1. Joules
2. Law of the conservation of energy.
3. Fuel
4. The sun
5. Black
6. Renewable – Solar, Hydroelectric, Tidal, Wind, Solar, Geothermal / Non renewable – Natural Gas, Coal, Oil
7. Non – renewable / Will run out / Cause pollution
8. Forces / Heating / Electrical work.
9. Efficiency
10. Tension / Elastic Potential
11. Thermal
12. Renewable resource
13. Gravitational Potential Energy
14. Cheap / Convenient / Easily transported
15. Cheap, easy to transport, efficient

7J Current & Electricity

1. Define: a measurement of how hard it is for electrons to flow around a cell..
2. Definition: materials that electricity does not easily flow through it.

Name the symbols:

3. 
4. 
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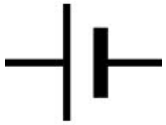
6. 
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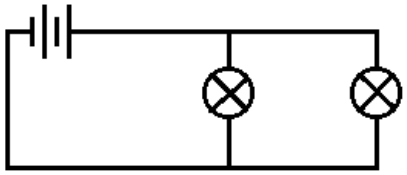
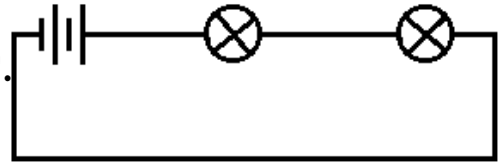
9. 
10. 
11. Define: the flow of electrons around a circuit.
12. If one bulb from circuit 9 was removed. What would happen to the other?
13. Define: the push given from a battery or cell.
14. If one bulb from circuit 10 was removed. What would happen to the other?
15. Definition: materials that allow electricity to easily flow through it.

7J Current & Electricity

1. Resistance
2. Insulator
3. Bulb
4. Battery
5. Voltmeter
6. Cell
7. Ammeter
8. Resistor
9. Parallel circuit
10. Series circuit
11. Current
12. Doesn't change (Stays lit)
13. Voltage (Potential difference)
14. Circuit is broken so bulb goes out
15. Conductor

7K Forces

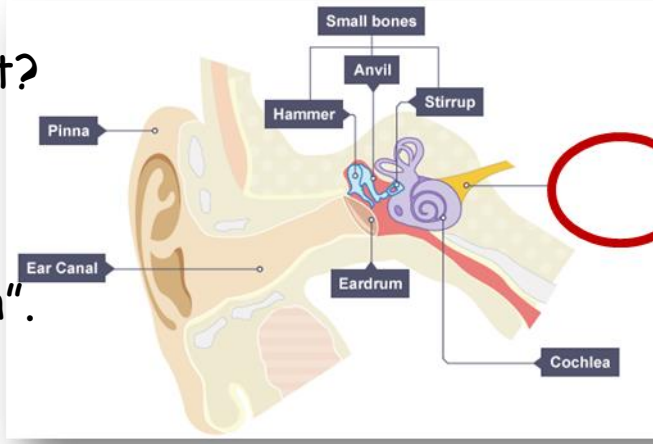
1. Name the unit force is measured in
2. The maximum a solid may be stretched without permanently altering the size/shape is called the…..
3. Name a non- contact force
4. If forces are balanced, they are equal and _____?
5. Name the non-contact force which acts toward the centre of the Earth
6. How can the effect of friction be decreased between two objects?
7. What is the resultant force of an object moving with a constant velocity?
8. What do we call the force which opposes the direction an object wants to slide?
9. If forces are unbalanced, the two forces are not _____?
10. What is a resultant force
11. Identify one of the three effects forces can have on an object
12. What is the unit for pressure other than N/m^2?
13. Name a contact force
14. What is the formula to calculate speed?
15. An object which does not return to its normal shape after being stretched or compressed is said to be ……

7K Forces

1. Newton (N)
2. Elastic limit
3. Magnetism / Gravity /Electrostatic
4. Opposite
5. Gravity
6. Increase surface area / Lubrication (smoothness of a surface)
7. 0N
8. Friction
9. Equal
10. Sum of the forces acting on an object
11. Any order Change shape / change speed / change direction
12. Pascals/Pa
13. Push/Pull / Friction / Drag (Air resistance) / Reaction / spring / tension
14. Speed = distance / time
15. Plastic

7L Sound

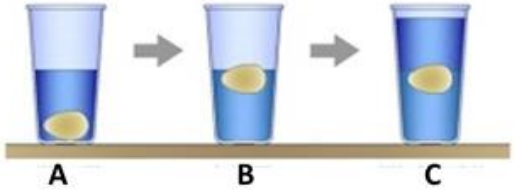
1. State how sounds are made.
2. State the scientific keyword that means "the number of waves or vibrations per second".
3. State the missing names of the part of the ear.
4. Name use of ultrasound that calculates distance using the time it takes reflected sounds to return.
5. State the part of the ear that passes sound, as an electrical impulse, to your brain.
6. In which state of matter does sound travel quickest?
7. State which travels faster, sound or light?
8. State what type of wave sound waves are.
9. State the effect of loud sounds on the ear drum.
10. State the scientific keyword that means "to take in".
11. Give a use of ultrasound.
12. State what waves do and do not transfer.
13. State the frequency of infrasound.
14. State the type of wave that vibrates perpendicular (at 90°) to the direction the waves travels.
15. State the scientific keyword that means "The size of vibrations / The distance a particle vibrates when a wave passes".



7L Sound

1. Vibrations
2. Frequency
3. Auditory nerve
4. Sonar
5. The auditory nerve
6. Solids
7. Light
8. Longitudinal
9. (Rupture / damage / break) the ear drum
10. Absorb
11. Foetal scanning / Sonar / Echolocation
12. Energy but not matter
13. Below 20Hz
14. Transverse waves
15. Amplitude

8I Fluids

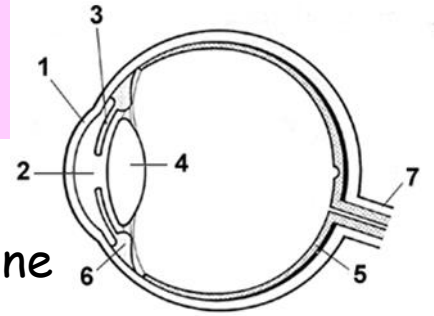


1. Write the formula for calculating the density of an object
2. Based on the position of objects A, B and C can you work out the density compared to the liquid (3 marks)
3. How does drag on a car change as it accelerates?
4. How does increasing temperature affect the pressure of a gas?
5. Water changing into steam is a physical change – why?
6. If you have two equal sized balls but one is heavier – what does this tell us about the particles in each ball?
7. How does the arrangement of particles change when it is heated? (2marks)
8. How does pressure on the outside of a plane change as it climbs?
9. Calculate the density of a cube with a mass of 100g and a volume of 20cm3
10. How does pressure on the outside change as a submarine dives to the sea floor?
11. Calculate the mass of a cube with a density of 6gcm3 and a volume of 120cm3
12. How could you describe the forces acting on C?

8I Fluids

1. Density = mass/volume
2. A – More dense than liquid B – Less dense than liquid
   C – Same density as the liquid
3. Drag increases
4. Temperature causes pressure to increase
5. The chemical formula does not change still H2O
6. The denser, heavier ball has more particles in the same volume
7. Particles move further apart / Particles move faster
8. Pressure decreases
9. 100/20 = 5g/cm3
10. Pressure increases
11. 720g
12. The forces are balanced

8J Light



1. What does light travel in? _____ lines
2. When light changes direction and speed after moving from one substance to another is known as
3. Light travels through a _____ as it travels from the Sun to Earth?
4. How does a red filter turn white light to red?
5. Why is does a green pen appear green in white light?
6. What is it called when light is reflected evenly by a smooth surface causing a reflection?
7. What is it called when light is scattered in all direction by opaque materials?
8. What happens to the speed of light when it goes from glass to air?
9. Why does a green shirt appear black under red light?
10. Name part 4 of the eye
11. What travels faster light or sound?
12. List the colour spectrum in order
13. We see non luminous objects because light _____
14. The distance between the centre of the lens and the focal point is called the _____
15. The angle of incidence is equal to what?

8J Light

1. Light travels in straight lines
2. Refraction
3. A vacuum
4. Transmits red light and absorbs blue and green
5. It absorbs all colours other than green/ reflects only green light
6. Specular reflection
7. Diffuse reflection
8. Speeds up
9. Green shirt will absorb red light
10. Lens
11. Light
12. Red, orange, yellow, green, blue, violet, indigo
13. Reflects
14. Focal length
15. Equal to the angle of reflection

8K Energy Transfers

1. How does surface area affect heat transfer?
2. Which method of heat transfer can happen in a vacuum?
3. State the energy transfer that occurs when you heat a pan.
4. State the colour solar panels are painted to absorb heat.
5. State an advantage of using low-energy appliances.
6. Name the process that cools objects down by allowing fast moving particles to escape the surface of a liquid as gas.
7. State the energy transfer that occurs in an oven.
8. Why are metals good conductors of heat?
9. State the units of energy.
10. State the colour houses in hot countries are painted white to reflect heat.
11. Which method of heat transfer can only happen in fluids?
12. State the conversion from Celsius to Kelvin.
13. State the units of temperature.
14. Define the word insulator.
15. Which method of heat transfer happens in solids?

8K Energy Transfers

1. The larger the surface area, the faster the heat transfer
2. Radiation
3. Convection.
4. Black
5. Saves energy / saves money / more efficient / wastes less energy.
6. Evaporation
7. Conduction
8. They have delocalised electrons / The atoms are closely packed (DENSE) so they pass on heat quickly
9. Joules (J)
10. White
11. Convection

12. Add (+) 273
13. Degrees Celsius (°C)
14. A material that heat doesn't move through easily
15. Conduction

8L Earth & Space Test

1. What do we call the model of the solar system with the Earth at the centre?
2. What do we call hot balls of hydrogen and helium which are large enough to maintain a nuclear reaction at its core
3. What do we call the model of the solar system with the Sun at the centre?

4. What do we call groups of millions or billions of stars?
5. What do we use to measure distances in space?
6. In which direction does gravity act?
7. What happens if two North poles of magnets get close to each other?

8. Name two magnetic metals (2 marks)
9. The swirling liquid metallic core of the Earth causes it to have what?
10. Which poles would need to be close for attraction to occur?
11. The 23° tilt of the Earth causes us to experience what?
12. What two factors affect the force of gravity? (2 marks)
13. What do we call a recognizable pattern of stars?

8L Earth & Space Test

1. Geocentric
2. Stars
3. Heliocentric

4. Galaxies
5. Light Years
6. Towards the centre of the Earth
7. Repel (Like charges repel)

8. Iron, Nickel and Cobalt
9. Magnetic field
10. North and South (Opposites attract)
11. Seasons
12. Distance and masses of the two objects
13. Constellation

CP2.1 Forces

1. State Newton's First law
2. Describe some factors that affect stopping distance.
3. State Newton's second law.
4. If the gravitational field strength increases, how does this affect weight.
5. State the resultant force when a force is balanced
6. State the equation for stopping distance.
7. State some typical reaction times in humans.
8. State the unit of force.
9. State Newton's third law.
10. Describe how weight is measured.
11. Define weight and include the equation.
12. Describe how changing mass changes acceleration.
13. What is the general equation for Newton's second law.
14. Describe how to measure human reaction times.
15. Describe some factors that affect human reaction time.

CP2.1 Forces

1. Bodies at rest or in motion stay that way until a force acts
2. Tiredness, wheel quality, weather, drugs, road condition, ORA
3. Change of acceleration is proportional to mass
4. Weight increases
5. 0N
6. Thinking distance + Braking distance = Stopping distance
7. 0.25s
8. Newton
9. When 2 objects interact, they exert equal but opposite forces
10. Newtonmeter
11. Force due to gravity (W = m x g)
12. Increase mass decreases acceleration.
13. F = m x a
14. Catch dropped ruler, measure length, convert with equation
15. Drug use, tiredness, concentration ORA

CP2.2 Motion

1. What is the equation used to calculate speed using distance and time?
2. State how to find the acceleration from a velocity/ time graph.
3. If Jeff runs at 4.3m/s for 20 seconds, what is his total distance covered?
4. State the typical speed of a person cycling a bike.
5. State the rate of acceleration of falling objects.
6. State how to find the distance travelled from a distance / time graph
7. Negative acceleration is also known as…
8. What is the correct, full definition of acceleration?
9. Why is an object moving at a constant speed in a circle an acceleration.
10. Give a pair of quantities with identical units, where one is vector and one is scalar
11. Define the term "vector quantity".
12. State the unit of acceleration
13. Define the term "scalar quantity".
14. Write the equation used to calculate acceleration
15. State how to find the distance travelled from a velocity / time graph.

CP2.2 Motion

1. Speed = distance / time
2. Find the gradient of a line
3. 86m
4. 6m/s
5. 9.8m/s2
6. Add the distance values of any line on a slope
7. Deceleration
8. The change in velocity over a period of time
9. The direction is changing, so the velocity is changing
10. Speed and velocity, distance and displacement, ORA
11. A quantity with magnitude and direction
12. m/s2
13. A quantity with magnitude no direction
14. a = (v-u) / t
15. Find the area under the line

CP3 Conservation of Energy

1. State the forms of energy stored in a) moving objects b) objects raised above the ground
2. Write the equation used to calculate acceleration
3. Name two renewable energy resources
4. State one advantage of using non-renewable energy resources
5. State one way this can be reduced
6. State two ways a house can limit heat loss
7. State the transfer or pathway that this energy leaves by
8. State the equation used to calculate change in gravitational potential energy
9. State one negative effect of using non-renewable energy resources
10. State the equation used to calculate kinetic energy
11. State the form of energy stored in batteries, and the transfer that moves energy from them
12. State the equation used to calculate efficiency
13. Name two non-renewable energy resources
14. When a car's brakes operate, which energy store in the brakes is increased?
15. Which force causes most energy wastage in mechanical devices?

CP3 Conservation of Energy

1. Kinetic / Gravitational Potential
2. a = (v-u) / t
3. Solar / Wind / Tidal / Biomass (ORA)
4. Easy to obtain, Easy to store, Easy to transport
5. Lubrication
6. Insulation / double glazing
7. Heating
8. GPE = m x g x h
9. Pollution, they will run out, increase green house gases,
10. KE = 0.5 x m x v2
11. Chemical Store, Electrical Transfer
12. Efficiency = useful output / total input
13. Nuclear / Coal / Oil / NATURAL Gas
14. Thermal store
15. Friction

CP4 - Waves

1. There are two ways to calculate the speed of a wave. Write the equations for both (2 marks)
2. State the unit of frequency
3. Which kind of waves are the ones on the surface of the sea?
4. Convert these into standard form (e.g. 3x108m/s = 300,000,000m/s)
5. 4kHz b)12mm c)500µm
6. If 400 waves pass a point in 2 seconds, what was the frequency of those waves?
7. State the piece of equipment used to measure angles
8. State the term for the bending of light when it enters a different medium
9. 0.0004 m b)12,000,000 Hz c)0.01m
10. Which travels faster, light or sound?
11. Which quantity of a wave is measured in metres?
12. If light enters a more dense medium, will it bend inwards or outwards?
13. The number of waves passing per second is called the wave's…
14. State the name of the line used to measure the angles of light when it enters a prism
15. Convert these into their base units (eg. 12km = 12,000m)

CP4 - Waves

1. $V = f \times \lambda$ and $v = x / t$
2. Hertz (Hz)
3. Transverse
4. Convert these into standard form (e.g. 3x108m/s = 300,000,000m/s)
5. 4000Hz b)0.012m c) 0.0005m
6. 200Hz
7. Protractor
8. Refraction
9. 4 x 10-4 m b)1.2x 107 Hz c) 1x10 -2m
10. Light
11. Wavelength
12. Inwards
13. Frequency
14. Normal
15. Convert these into their base units (eg. 12km = 12,000m)

CP5 – Light and the EM Spectrum

1. Write the EM spectrum in order, starting from radio waves
2. State a danger of the infra-red range of EM waves
3. State the range of EM waves that has the highest energy
4. Name the range of EM waves that humans detect using our eyes
5. Name the range(s) of EM waves that can cause ionisation of atoms
6. Which range(s) of EM waves are useful in medical treatments?
7. All EM waves travel at the same speed in a vacuum – what is that speed known as?
8. State two uses for radio waves
9. Name any other EM waves that humans can detect using their senses
10. State another use of this range of EM waves
11. Name the range of EM waves that is typically used for night vision
12. State the range of EM waves that has the highest frequency
13. State the range of EM waves that has the largest wavelength
14. On the EM spectrum, as wavelength increases, how does frequency change?
15. Name the range of EM waves that can cause sunburn

CP5 – Light and the EM Spectrum

1. Radio waves, microwaves, Infrared, Visible, Ultraviolet, X-Rays, Gamma Rays
2. Skin burn
3. UV, X-ray, Gamma Ray
4. Visible light
5. X rays, Gamma rays
6. X rays, Gamma rays
7. Light speed
8. RADAR, Communication, ORA
9. I.R - touch
10. Heat therapy
11. I.R
12. Gamma Rays
13. Radio waves, Microwaves, Infrared
14. Decreases
15. UV

CP6 - Radioactivity

1. Name the two particles found in an atom that have a charge
2. Which form of ionising radiation has no mass and zero charge?
3. State the part of the atom where most of the mass is concentrated
4. When a source of ionising radiation enters the body, you are said to be…
5. Name the form of ionising radiation that is mostly blocked by lead
6. Which form of radioactive decay consists of two protons and two neutrons?
7. For an astronaut, what will be the main source of background radiation?
8. What causes an electron to move to a higher orbit?
9. Name the device used to count levels of ionising radiation
10. (6^12)C (6^14)C Write the numbers of protons and neutrons in these atoms
11. Name the unit for measuring the activity of a radioactive source
12. Name the process that occurs when an atom loses or gains an electron
13. State the particle in an atom that has a neutral (zero) charge
14. Name the main source of natural background radiation on earth
15. Name the form of ionising radiation that is most strongly ionising

CP6 - Radioactivity

1. Protons and Electrons
2. Gamma Radiation
3. Nucleus
4. Irradiation
5. Gamma
6. Alpha radiation
7. Cosmic rays
8. Input of EM radiation, increased energy
9. Geiger Muller Tube
10. (6^12)C 6 Protons 6 Neutrons (6^14)C 6 Protons 8 Neutrons
11. Becquerel (Bq)
12. Ionisation
13. Neutron
14. Radon gas
15. Alpha

CP7/8 – Energy, forces & their effects

1. Why do we always think of force as a vector quantity?
2. What effects can a resultant force have on an object?
3. State two other examples of vector quantities
4. Newton's third law: "to every action there is an _____"
5. Name the energy stored in objects that are raised above the ground
6. State two examples of contact forces
7. State two examples of non-contact forces
8. Define the term 'power' as used in physics
9. State two factors that will increase somebody's braking distance
10. 'Work done' is another term used for…
11. State the equation used to calculate work done, when you know the force used and the distance it was used for
12. State the equation used to calculate power
13. State two examples of scalar quantities
14. State the units for force, work done and power
15. Name the energy stored in moving objects

CP7/8 – Energy, forces & their effects

1. Forces are always in a direction
2. Acceleration, deceleration, maintain steady speed (ORA)
3. Velocity, Displacement (ORA)
4. Equal and opposite reaction
5. Gravitational Potential
6. Friction, Air resistance, Thrust, (ORA)
7. Gravity, Magnetism, Static
8. Energy transferred per second
9. Road condition, tyre condition, brake condition, weather condition (ORA)
10. Energy tranferred
11. $E = F \times d$
12. $P = E / t$
13. Speed, Distance (ORA)
14. Newton (N), Joule (J), Watts (W)
15. Kinetic

CP10 – Electricity and Circuits

1. The term used for a packet of charge: _____
2. Write the equation to calculate power if energy and time are known
3. The rate the charges are moving is known as: _____
4. Name three kinds of resistor
5. Write the equation to calculate power if current and voltage are known
6. Write the equation to calculate Charge, if you know Current and Time
7. Two different ways to arrange circuits
8. The equation used to calculate voltage if resistance and current are known
9. A diode only allows current to move in…
10. The units of resistance, potential difference and current
11. All materials have some electrical _____, which limits current
12. The charged particle that moves in an electrical circuit
13. This provides the 'push' that moves the charges: _____
14. The definition of a volt
15. If 12V is given to two identical bulbs in series – what is the voltage in each?

CP10 – Electricity and Circuits

1. Coulomb
2. P = E/ t
3. Current
4. Ohmic (fixed), thermistor, Light Dependent
5. P=I x V
6. Q = I x T
7. Series or parallel
8. V=I x R
9. One Direction
10. OHM Ω, VOLT, AMPS
11. Resistance
12. Electron
13. P.D or Voltage
14. Joule per Coulomb
15. 6V

CP12/13 – Magnetism, motor effect and electromagnetic induction

1. The strongest points of a magnet: _____
2. ….and fingers represent…
3. Which of these is not a magnetic metal: aluminium, iron, steel, cobalt, nickel
4. A coil of wire with a current running through it is known as a: _____
5. State one use of a permanent magnet
6. On the right hand rule, thumb represents…
7. State one assumption we make about transformers when calculating power
8. State the purpose of a transformer
9. How do iron filings indicate the strongest part of a magnet?
10. How can we show the direction of this field?
11. Why does earth produce a magnetic field of its own?
12. State the order of voltages running from the power plant to homes
13. What is an induced magnet?
14. Write the equation to calculate power using current and voltage
15. State one use of an electromagnet

CP12/13 – Magnetism, motor effect and electromagnetic induction

1. Poles
2. the magnetic field and the current
3. Aluminium
4. Solenoid
5. Any relevant use including, computers / decorative magnets
6. The force
7. 100% efficient
8. The step up and step down voltage
9. Where they are more concentrated.
10. A compass
11. Iron core
12. 25,000V, 400, 000V, 230V
13. A magnet made magnetic (by current in a wire or a permanent magnet)
14. P = I x V
15. Any relevant use including, moving cars / s;avage / recycling metals

CP14/15 – The Particle Model

1. In which state(s) of matter can a substance be compressed?
2. If an object is deformed, but returns to its original shape it is said to be:_____
3. In which state(s) of matter can a substance flow to fit its container?
4. State the unit used to measure energy.
5. State what causes gas pressure in a balloon
6. What is the minimum number of forces needed to deform an object?
7. What effect does this have on the pressure of the gas?
8. Convert these temperatures from °Celsius to Kelvin: 0°C, -12°C, 1400°C
9. Name the piece of equipment used to find the volume of irregular objects
10. What is the term used meaning "the energy needed to raise the temperature of 1kg of a substance by 1°C"?
11. State the equation used to calculate density.
12. Convert these temperatures from Kelvin to °Celsius: OK, 100K, 300K
13. In which state(s) of matter will a substance fill its container completely?
14. How does the movement of gas particles change as they heat up?
15. State the equation linking force (N), extension (m) and spring constant (N/m)

CP14/15 – The Particle Model

1. Gases
2. Elastic
3. Liquid
4. Joule
5. Collisions
6. 2
7. Increase pressure
8. Convert these temperatures from °Celsius to Kelvin: 273K, -261K, 1673K
9. Overflow can
10. Specific heat capacity
11. D = m / V
12. Convert these temperatures from Kelvin to °Celsius: -2730C, -1730C, 260C
13. Gas
14. Increase velocity
15. f = χ x K