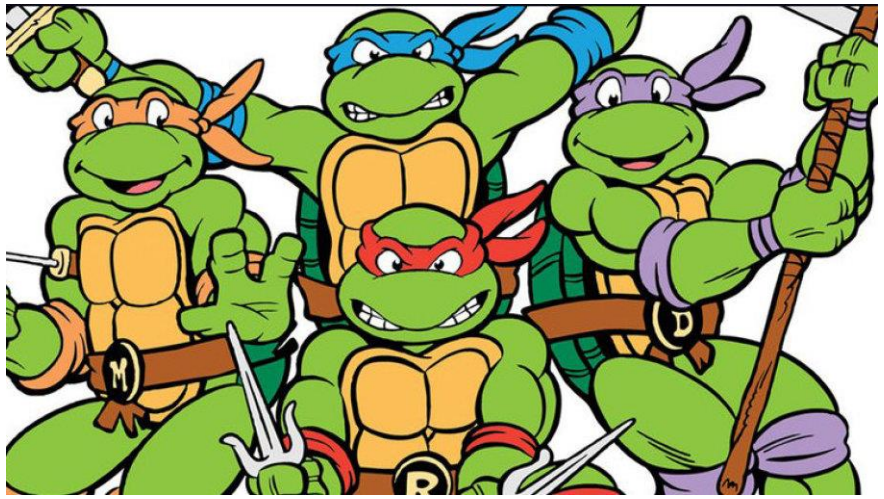
Knowledge Ninja



Questions 1

1. What is the equation that links kinetic energy, mass and speed?
2. Describe the changes to energy stores when a ball is thrown into the air.
3. What is the unit of work?
4. What is the resultant force acting on a car travelling at a steady speed?
5. Which part of the electromagnetic spectrum has the highest frequency?

Answers 1

1. Kinetic energy = ½ x mass x (speed)^2
2. Kinetic energy store of the ball decreases, gravitational potential energy store of the ball increases.
3. Joule (J).
4. Zero.
5. Gamma rays.

Questions 2

1. Calculate the work done when an object is moved 2 metres by a force of 10 Newtons.
2. What is the equation that links frequency, wave speed and wavelength?
3. Name the four types of radioactive decay.
4. Which state of matter has the highest energy?
5. Define specific heat capacity.

Answers 2

1. 2 m x 10 N = 20 Joules
2. Wave speed = frequency x wavelength
3. Alpha particle, beta particle, gamma ray, neutron decay.
4. Gas.
5. The energy required to raise 1 kg of a substance by 1 degree celcius.

Questions 3

1. Give an example of a transverse wave.
2. Which type of radiation is the most ionising?
3. Give two factors that affect the braking distance of a car.
4. Define specific latent heat.
5. What is the difference between elastic and inelastic deformation?

Answers 3

1. Ripples on the surface of water, electromagnetic waves.
2. Alpha particle.
3. Condition of brakes, condition of tyres, condition of road, speed of vehicle, mass of vehicle.
4. The energy required to change the state of 1 kg of a substance without a change in temperature.
5. Elastic deformation the object returns to its original size when it is plastically deformed it does not.

Questions 4

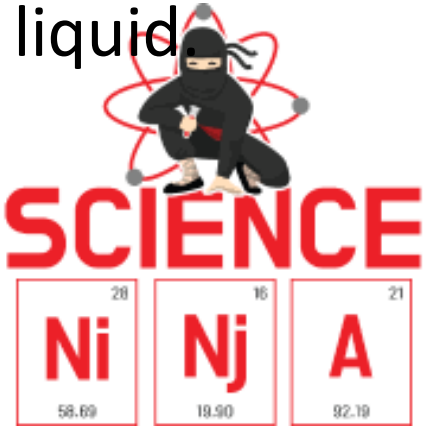
1. Give an example of a longitudinal wave.
2. Where in the atom is most of the mass located?
3. Which type of radiation is the most penetrating?
4. Newton's Second Law states that Force is equal to what?
5. What is the unit of power.

Answers 4

1. Sound.
2. Nucleus.
3. Gamma rays.
4. Force = mass x acceleration (F= ma)
5. Watt (W).

Questions 5

1. Which particles in the atom have a positive charge?
2. Give two factors which affect thinking distance when stopping a car.
3. What does Newton's Third Law say about the forces between two objects?
4. What is the equation that links resistance, potential difference and current?
5. Describe the arrangement and movement of particles in a liquid.



Answers 5

1. Proton.
2. Fatigue, drugs or alcohol, illness
3. Whenever two objects interact, the forces they exert on each other are equal and opposite.
4. Potential difference = current x resistance (V= IR)
5. Close together, irregular arrangement, moving around each other.

Questions 6

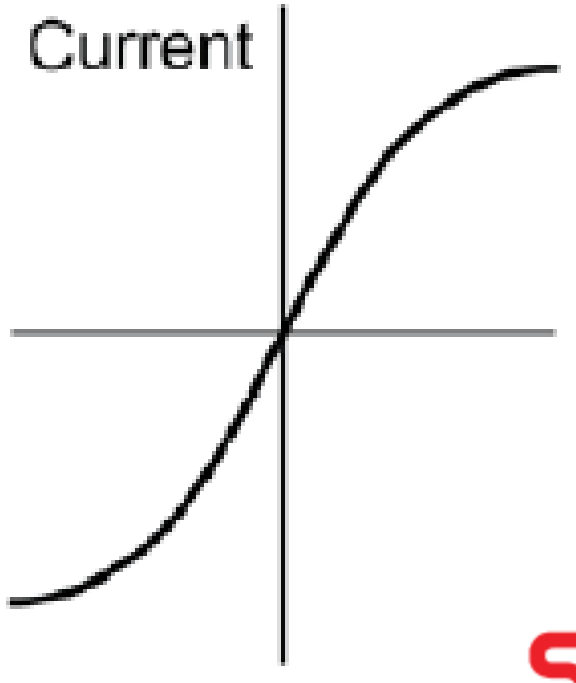
1. Define stopping distance of a vehicle.
2. What does the gradient of a distance –time graph tell you?
3. Define a vector and give an example.
4. What is the unit of weight?
5. What is the equation to calculate the energy efficiency of an electrical device?

Answers 6

1. Stopping distance = thinking distance + braking distance
2. The speed.
3. A quantity that has both magnitude(size) and direction, eg. Velocity.
4. Newton.
5. Efficiency = useful output energy / total input energy (x 100 as a percentage)

Questions 7

1. What does the area under a velocity – time graph tell you?
2. What equation can you use to calculate the spring constant of a spring?
3. What is the unit of time used in physics?
4. What is the definition of half-life?
5. What component is the graph for:



Answers 7

1. Total distance travelled.
2. Force = spring constant x extension (F = ke)
3. Seconds.
4. The time taken for the count rate or activity of a radioactive sample to halve.
5. Filament lamp.

Questions 8

1. Define a scalar and give an example.
2. What is the name of the container used to find the volume of an irregular shaped object?
3. Describe the arrangement and movement of particles in a gas.
4. State what is meant by the internal energy of a substance.
5. What is the equation that links distance, time and speed?

Answers 8

1. A scalar has magnitude only, eg. Speed.
2. Eureka or displacement can.
3. Far apart, moving fast and randomly.
4. The sum of the kinetic energy and potential energy of the particles.
5. Speed = distance / time

Questions 9

1. What two quantities do you have to measure to calculate the density of an object?
2. Describe the arrangement and movement of particles in a solid.
3. Describe the difference between series and parallel circuits.
4. What do LDR and LED stand for?
5. What are typical speeds for walking, running and cycling in metres per second?

Answers 9

1. Mass and volume.
2. Regular arrangement, close together, vibrate in fixed positions.
3. A parallel circuit has more than one branch or loop, a series circuit has only one branch or loop.
4. Light Dependent Resistor and Light Emitting Diode.
5. Walking 1.5 m/s, running 3 m/s, cycling 6 m/s

Pre-Fixes and Maths

1. What is 5MJ in standard form?
2. What is 10mA in standard form?
3. What is 0.5km in standard form?
4. If the diameter of a circle is 3m,what is the radius?
5. How do you work out the volume of a regular shaped object?

Pre-Fixes and Maths answers

1. 5×10^{6} Joules
2. 1×10^{-2} Amps
3. 9.5×10^{3} km.
4. 1.5m
5. Length x width x height