GCE 'O' Level Physics
List of Definitions

## CHAPTER 2 – KINEMATICS

1. **Distance** – length of travel with no respect to the direction of motion.
2. **Displacement** – distance travelled in a specific direction.
3. **Speed** – rate of change of distance.
4. **Uniform Speed** – constant rate of change of distance.
5. **Velocity** – rate of change of displacement.
6. **Uniform Velocity** – constant rate of change of velocity.
7. **Acceleration** – rate of change of velocity.
8. **Uniform Acceleration** – constant rate of change of acceleration.

## CHAPTER 3 – DYNAMICS

Students need not state the definitions of Newton's Laws but understand and apply them.

1. **Newton's First Law of Motion** – an object at rest will remain at rest and an object in motion will continue being in motion at constant speed in a straight line in the absence of a resultant force acting on it.
2. **Newton's Second Law of Motion** – the resultant force acting on an object is equivalent to the product of the mass and the acceleration of the object.
3. **Newton's Third Law of Motion** – if an Object A exerts a force on Object B, Object B will exert an equal force in the opposite direction on Object A.

## CHAPTER 4 – MASS, WEIGHT AND DENSITY

1. **Mass** – the amount of matter present in an object.
2. **Weight** – the amount of force acting on an object due to gravitational force.
3. **Inertia** – an object's resistance to change either its state of rest, or when moving, its motion.
4. **Gravitational Field Strength** – the amount of gravitational force per unit mass.
5. **Density** – the amount of mass an object has per unit volume

## CHAPTER 5 – TURNING EFFECT OF FORCES

1. **Moment of a Force** – the product of a force and its perpendicular distance from the line of action of the force to the pivot.
2. **Principle of Moments** – an object is in equilibrium when the sum of the clockwise moments about the pivot is equivalent to the sum of anticlockwise moments about the same pivot.
3. **Centre of Gravity** – the point through which the entire weight of an object appears to act.

## CHAPTER 6 – PRESSURE

1. **Pressure** – the amount of force per unit area.

## CHAPTER 7 – WORK, ENERGY AND POWER

1. **Work Done** – the product of the force acting on an object and the distance travelled in the direction of the force.
2. **Energy** – the capacity to do work.
3. **Conservation of Energy** – energy can neither be created nor destroyed but converted from one form to another.
4. **Power** – the rate of doing work.
5. **Efficiency** – the ratio of an object's useful energy output to the total energy input.

## CHAPTER 8 – KINETIC MODEL OF MATTER

1. **Brownian Motion** – the haphazard movement of microscopic particles suspended in a fluid due to the uneven bombardment of these suspended particles by the fluid molecules.

## CHAPTER 9 – TEMPERATURE

1. **Temperature** – how cold or hot a substance is.
2. **Thermal Equilibrium** – two objects having the same temperature and there is no net transfer of thermal energy.

## CHAPTER 10 – TRANSFER OF THERMAL ENERGY

1. **Conduction** – the transfer of thermal energy through a medium from one particle to another through molecular vibrations and collisions.
2. **Convection** – the transfer of thermal energy from one place to another through the movement of a heated liquid or gas.
3. **Radiation** – the transfer of thermal energy by electromagnetic waves.

## CHAPTER 11 – THERMAL PROPERTIES OF MATTER

1. **Heat Capacity** – the amount of thermal energy required to raise the temperature of an object by 1K or 1°C.
2. **Specific Heat Capacity** – the amount of thermal energy required to raise the temperature of 1kg of an object by 1K or 1°C.
3. **Melting** – the process when energy is supplied to change the state of a substance from solid to liquid without a change in temperature.
4. **Freezing** – the process when energy is supplied to change the state of a substance from liquid to freezing without a change in temperature.
5. **Boiling** – the process when energy is supplied to change the state of a substance from liquid to gas without a change in temperature.

6. **Condensation** – the process when energy is supplied to change the state of a substance from gas to liquid without a change in temperature.
7. **Latent Heat** – the amount of energy required to change the state of a substance from solid to liquid or from liquid to gas.
8. **Latent Heat of Fusion** – the amount of energy needed to change the state of a substance from solid to liquid without a change in temperature.
9. **Specific Latent Heat of Fusion** – the amount of energy needed to change the state of 1kg of a substance from solid to liquid without a change in temperature.
10. **Latent Heat of Vapourisation** – the amount of energy needed to change the state of a substance from liquid to gas without a change in temperature.
11. **Specific Latent Heat of Vapourisation** – the amount of energy needed to change the state of 1kg of a substance from liquid to gas without a change in temperature.

## CHAPTER 12 – GENERAL WAVE PROPERTIES

1. **Wavefront** – an imaginary line connecting points that are in the same phase.
2. **Wave crest** – the highest point of a wave.
3. **Wave trough** – the lowest point of a wave.
4. **Amplitude** – maximum displacement of a wave from equilibrium.
5. **Wavelength** – horizontal distance between two successive crests or troughs.
6. **Frequency** – number of crests or troughs that pass through a point per second.
7. **Period** – the time taken for one wave to complete a cycle.
8. **Transverse Waves** – waves that vibrate perpendicular to the direction of the travel of the wave.
9. **Longitudinal Waves** – waves that vibrate parallel to the direction of the travel of the wave.

## CHAPTER 13 – LIGHT

1. **Principle of Reversibility** – a ray of light will take the same path of travel even if its direction of travel is reversed.
2. **Refractive Index** – the ratio of the speed of light in a vacuum to the speed of light in the given medium.
3. **Critical Angle –** the angle of incidence that provides an angle of refraction of 90°.
4. **Total Internal Reflection** – When the angle of incidence is larger than the critical angle, the incident ray will be reflected internally. It occurs when light travels from an optically denser medium to a less optically dense medium.
5. **Principal focus (focal point)** – point on the principal axis to which an incident beam parallel to the principal axis converges.
6. **Focal length** – distance between the lens' optical centre and principal focus.

## CHAPTER 15 – SOUND

1. **Echo** – reflection of sound waves from a surface heard as a series of sounds.
2. **Ultrasound** – a sound with frequencies above the upper limit of normal human hearing.

## CHAPTER 16 – STATIC ELECTRICITY

1. **Laws of Electrostatics** – like charges repel, unlike charges attract.
2. **Electric Field** – a region where an electric charge experiences an electric force.

## CHAPTER 17 – CURRENT OF ELECTRICITY

1. **Current** – rate of flow of charge.
2. **Electromotive Force** – work done by the source in driving a unit charge around a complete circuit.
3. **Potential Difference** – work done to drive a unit charge through the electrical component.
4. **Resistance** – ratio of potential difference across the component to the current flowing through it.
5. **Ohm's Law** – the current through a metallic conductor is directly proportional to the potential difference across the ends of the conductor, provided the temperature and other physical conditions remain constant.
6. **Resistivity** – the strength of a material in opposing electric current.

## CHAPTER 18 – D.C. CIRCUITS

1. **Potentiometer** – a variable resistor which is used to vary voltage.
2. **Input Transducer** – a device that converts non-electrical energy into electrical energy (e.g. microphone).
3. **Output Transducer** – a device that converts electrical energy into non-electrical energy (e.g. loudspeaker).
4. **Light-Dependent Resistor (LDR)** – a resistor whose electrical resistance varies as the amount of light falling on it changes.
5. **Thermistor** – a thermal resistor whose resistance varies with temperature.

## CHAPTER 20 – MAGNETISM

1. **Laws of Magnetism** – like poles repel, unlike poles attract.

## CHAPTER 21 – ELECTROMAGNETISM

1. **Solenoid** – a current-carrying wire that has been wound many times into a tightly packed coil.

## CHAPTER 22 – ELECTROMAGNETIC INDUCTION

It is useful to state Faraday's and Lenz's Laws of Electromagnetic Induction in explaining a bicycle dynamo, transformer and the galvanometer deflection experiment.

1. **Faraday's Law of Electromagnetic Induction** – when a conductor experiences a varying magnetic field, an electromotive force is induced in the conductor.
2. **Lenz's Law of Electromagnetic Induction** – the induced current will oppose the change in the magnetic field that causes the induced current.