

	Physics Module 1 – Forces & Light You must be able to complete /understand all the previous pathway information to reach your pathway
7-9	Describe the ways in which the size of drag forces can be changed. Describe the causes of air and water resistance. Explain what is meant by the terms limit of proportionality and elastic limit. Explain how Hooke's law is applied to the way force meters work. Explain the difference between mass and weight. Evaluate energy-saving appliances or modifications. State the meaning of: convex mirror, concave mirror. Use ray diagrams to explain some of the features of images in periscopes. Describe some uses of total internal reflection such as in optical fibres.
6-8	Suggest how and why friction can be reduced or increased in unfamiliar situations. Recall, rearrange and use the density equation Explain the term elastic limit. Recall, rearrange and use the equations $F=ma$, Identify useful and wasted energies. Apply the idea of different colours being good or poor absorbers. Describe the characteristics of the image formed by a plane mirror and use ray diagrams to explain its formation. Explain why objects look different in light of different colours.
5-7	Explain some ways in which friction can be changed. Describe how the extension of a spring depends on the force applied. Identify situations and places where different forces can be found. Calculate the resultant forces. Compare conduction, convection, radiation and evaporation as methods of heat energy transfer using particle theory. Compare the effects of different rates of conduction in different materials. Evaluate different ways of keeping something warm. Use and rearrange Power equation. Calculate the cost of electricity.
4-6	Recall equation Density = mass/ Vol and unit g/cm^3 . Describe how to use a force meter. State Hooke's law. State what is meant by extension, compression, stretch, elastic and plastic behaviour. Classify forces as contact and non-contact forces. State the meaning of balanced and unbalanced forces. Recall the equations $F=ma$. Compare conduction in thermal conductors and thermal insulators. Evaluate ways of increasing or decreasing energy transfer by conduction, convection, radiation and evaporation. Recall equation for work done = force x distance & SI units Nm. Recall power = rate of energy transfer SI units kJ/s or KW. Compare conduction in thermal conductors and thermal insulators. Evaluate ways of increasing or decreasing energy transfer by conduction, convection, radiation and evaporation. Recall equation for work done = force x distance & SI units NM. Recall power = rate of energy transfer SI units kJ/s or KW. State the meaning of: diffuse, incident ray, reflected ray, normal. Use the ray model of light to explain how a periscope works. Explain why refraction occurs and why a pencil looks bent in water. Explain why coloured objects appear coloured. Explain how filters can be used to make coloured light.
3-5	State what is meant by contact eg friction and non-contact forces. Describe how friction forces affect movement, friction can be changed and some uses. Describe a method to find the volume of an irregular object. Recall the effects of forces on an object. State what is meant by mass and weight. Recall the direction in which gravity appears to act. Describe the processes of heating and cooling by radiation and evaporation. Explain why power companies use the kWh as a measure of energy. Use the ray model of light to explain how we see objects. Draw ray diagrams to describe the refraction of light as it passes into and out of different media. Describe how to split light into different colours using a prism and correctly use the terms spectrum and dispersion. Recall that the appearance of an object depends on the colour of light shining on it.
2-4	Describe how energy is transferred in conduction, convection, evaporation and radiation. Define terms emitter and absorber. Define evaporation Recall what power stations are used for. Identify the process(es) in which energy is transferred by heating in a given situation Recall the law of reflection. Describe some uses of plane mirrors. Describe the difference between even reflection and scattering. State the meaning of: refraction, angle of refraction, refracted ray. Recall secondary colours.
1-3	Recall the different types of resistive forces and describe how they affect movement. Recall substances that can float or sink in water. Recall that energy can be transferred by heating in conduction, radiation and convection. Recall examples of common thermal conductors and insulators. Recall ways of reducing energy transfer by conduction, convection and evaporation. Identify useful and wasted energies. Recall some advantages of low-energy appliances. Name sources of light. State the meaning of: reflect, scatter, transmit, absorb, transparent, opaque and, translucent. Recall that light and sound travel at different speeds in different materials. Recall the colours of the visible spectrum, in order. Recall the primary colours for light.

	Physics Module 2 – Electrical Relationships/ Moments & Moons You must be able to complete /understand all the previous pathway information to reach your pathway
7-9	Use the relationships $R=V/I$ to explain the behaviour of current, p.d. and resistance in series and parallel circuits. Explain how potential difference and energy are linked. Explain how the resistance of a wire varies with its length and thickness. Explain why the resistance of a filament lamp increases with increasing potential difference. Use Fleming's left-hand rule and the right-hand grip rule. Explain how gears work using ideas about moments. Explain why the actual mechanical advantage may not be the same as the theoretical value. Use the idea that a force can be represented by two orthogonal forces.
6-8	Recall, rearrange and apply the equations, $R=V/I$ Define current as the rate of flow of charge (usually electrons). Define p.d. as energy transferred per coulomb of charge. Define the resistance of a component as the ratio of the p.d. across the component to the current through the component. Describe how the resistance of a filament lamp changes with potential difference. Use ideas about conservation of energy when explaining how simple machines work. Work out the mechanical advantage of simple machines.
5-7	Model circuits using simple circuit diagrams. Analyse quantitatively the moments acting in a system by applying the principle of moments Model the relationship between the Earth, Moon and Sun to explain the phases of the moon.
4-6	Plan an investigation into how the resistance of a wire changes with length or thickness. Recall and use the equations $R=V/I$ Identify the pivot, load and effort in Class 2 and Class 3 levers. Describe the formation of craters by asteroid impacts Describe how a solar eclipse and a lunar eclipse are formed
3-5	Describe how a voltmeter and ammeter are used. Recall how the current changes when the potential difference of the supply changes. Describe how current and potential difference behave in series and parallel circuits Recall that an object will balance if the moments are equal and opposite. Describe the factors that affect the size of a moment. Explain how we can see the surface of the moon in terms of the sun and reflection Describe how the moon appears to change over the course of a month. Draw diagrams showing a solar and a lunar eclipse
2-4	Define current, potential difference Recall units of A,V Define resistance in words. units Ω Describe the relationship between resistance and current. Describe how the resistance of a wire varies with length and thickness. State what is meant by a moment of a force and recall its units. State the meaning of efficiency and recall some advantages of efficient appliances. Explain how levers are used in common devices. Recall that if the force needed is decreased the distance it moves is increased. Define an asteroid List some phases of the moon
1-3	Identify common circuit components and their symbols and where to place a voltmeter and ammeter in a circuit Recall some dangers of electricity and give some appropriate safety measures State what is meant by resistance and name its units. List examples of balanced and unbalanced forces Describe how a simple lever can magnify force or distance. Give examples of useful levels Describe how a ramp or a simple pulley system can reduce the force needed to lift an object. Moon is not a source of light – moon reflects light from the sun