Here are all the learning outcomes for what you have covered in the course so far in 5th year. It is helpful to go through this list and tick off what you are familiar with using the colour codes.

- Green light – happy with my knowledge
- Amber light – needs some work
- Red light – needs a lot of revision

Don't expect to know all of these, this is a very detailed list, H1 students should be 85% green lights for instance.

	Linear Motion	Green light	Amber light	Red Light
1.	Define and give the units for mass, length and time			
2.	Define and give the formula and units for speed, velocity and acceleration			
3.	Define and give the unit for displacement			
4.	Describe how to measure velocity and acceleration Using a ticker tape timer			
5.	Use distance –time to solve problems			
6.	Calculate the slope of the graph to measure speed/velocity			
7.	Use the equations of motion to solve for speed, distance, time and acceleration			
8.	**Derive the 3 equations of motion**			
9.	Use and velocity time graphs to solve problems. Calculate the slope to measure acceleration			
10.	Define Acceleration Due to Gravity			
	Vectors			
	Distinguish between vector and scalar quantities			
1.	Identify everyday examples of vectors			
2.	Identify the vector nature of physical quantities- represent a vector quantity on a diagram			
3.	Use the parallelogram and triangle law to find the resultant of two vectors			
4.				

	Force Mass and Momentum	Green light	Amber light	Red Light
1.	Define and give the unit of Force, Mass and Momentum			
3.	Define the unit of Force – the Newton			
4.	State Newton's Three Laws			
5.	Discuss everyday examples of these laws such as seat belts, rocket travel etc			
6.	Show that F = ma is a special case of Newton's Second Law			
7.	Know that Friction is a force that opposes motion			
8.	Discuss the importance of friction as an everyday force such as in walking and the use of lubricants			
9.	State the principle of conservation of momentum (not the formula!)			
10.	*Experiment:* Verify the principle of conservation of momentum			
11.	Perform calculations using the fact that momentum in conserved such as in collisions, acceleration of spacecraft and jet engines.			
12.	*Experiment:* Perform an experiment to show that a is proportional to F			

	Gravity	Green light	Amber light	Red Light
1.	State Newton's Law of Gravitation			
2.	Compare the gravitational forces between the Earth and the Sun and between the Earth and the Moon			
3.	Know that weight(W) = mg			
4.	Use the formula F = $\frac{G M_1 M_2}{d^2}$			

5.	**Derive the formula g = $\frac{GM}{R^2}$**			
6.	Calculate the value of g on other bodies in space for example the moon.			
7.	Explain why the moon has no atmosphere			

	Pressure and Density	Green light	Amber light	Red Light
1.	Define and give the units for density and pressure in liquids and gases			
2.	Define the Pascal			
3.	Know that pressure is a scalar quantity			
4.	Calculate pressure at depth due to a liquid			
5.	Define Boyles Law, Archimedes Principle and the Law of Flotation			
6.	Demonstrate the effect of atmospheric pressure by means of the collapsing can experiment.			
9.	Recall that pressure in a liquid at a given depth is the same in all directions and increases with depth			
10.	Be able to perform calculations to show the use of Boyles Law			
11.	Perform an experiment to verify Boyle's Law			
12.	Demonstrate Archimedes Principle and the Law of Flotation			
13.	Know what a Hydrometer is and how works			
14.	Know the relationship between atmospheric pressure and the weather			

	Moments	Green light	Amber light	Red Light
1	*Experiment:* Prove the laws of equilibrium			
2.	Define the moment of a force			
3.	Know that the sum of the moments about any point is zero for a body in equilibrium			
4.	Know the 2 conditions needed for equilibrium			
5.	Perform calculations to show static and dynamic equilibrium			
6.	Define lever			
7.	Define couple			
8.	Use the formula for the moment of a couple (Torque)			

	Work Energy and Power	Green light	Amber light	Red Light
1.	Define and give the unit of work			
2.	Define the joule			
4.	Give real life examples of work such as lifts and escalators			
5.	Perform simple calculations involving force and displacement in the same direction only			
6.	Define and give the units for energy.			
7.	List, demonstrate and describe the different forms of energy			
8.	Outline sources of both renewable and non-renewable energy			
9.	Know that mass is a form of energy and that $E = mc^2$			
10.	State the principle of conservation of energy and Give 2 examples of how energy can be converted from one form into another (eg in a speaker)			
12.	Know how to be efficient with energy in homes			
13.	Define power as the rate of doing work and give the appropriate unit			

14.	Be able to complete Power and work calculations			
16.	Calculate % efficiency by using the formula $= \frac{Power\ output \times 100}{Power\ Input}$ PE			

	Temperature	Green light	Amber light	Red Light
1.	Define temperature and give its unit			
2.				
3.				
4.	Know the relationship between the Celsius and the Kelvin scale			
5.	Define thermometric property			
6.				
7.	Show how you can use a thermometric property to measure temperature			
8.	Discuss the differences between thermometers and why we have a standard thermometer			
9.				
10.	Perform an experiment to plot the calibration curve or a thermometer using a laboratory mercury thermometer as standard			
11.	Know the practical use of thermometers including clinical thermometers, oven thermometers, boiler thermometers and temperature gauges in cars.			

	Heat	Green light	Amber light	Red Light
1.	List the three states of matter			
2.	Know that heat is form of energy which causes a rise in temperature			
3.	Define and give the units for heat capacity			
4.	Define and give the units for specific heat capacity			

5.	Perform simple calculations using the formula $Q = mc\Delta\theta$			
6.	Know the operation of storage heaters and why you need large heat capacity bricks within them			
8.	Define and give the units for latent heat			
9.	Define specific latent heat of fusion and vaporisation			
	Discuss the use of a heat pump			
14.	Define conduction			
15.				
16.	Be able to explain a simple experiment to compare conduction in different materials			
17.	Define U values and discuss their use in houses			
18.	Define convection			
19.	Discuss convection in Domestic hot-water and heating systems			
20.	Perform experiments to show convection in liquids			
21.	Define radiation and the solar constant			
.	*Mandatory Experiments*			
1.	Calibration curve of a thermometer using the laboratory mercury thermometer as a standard			
2	Measurement of specific heat capacity of water			
3	Measurement of the specific latent heat of fusion of ice			
4	Measurement of the specific latent heat of vaporisation of water			

	Waves and Wave Motion	Green light	Amber light	Red Light
1.	Distinguish between mechanical and electromagnetic waves			

2.	Define longitudinal and transverse waves			
3.	Give examples of longitudinal and transverse waves including radio waves, seismic waves and waves at sea			
4.	Define and give the units for the frequency, amplitude, wavelength and velocity of a wave			
5.	Perform calculations using the formula $c = f\lambda$			
6.	Define Reflection, Refraction, Diffraction, Interference and Polarisation.			
7.	Describe simple demonstrations using slinky, ripple tank, microwaves, *or* other suitable methods to show wave phenomenon			
8.	Distinguish between constructive and destructive interference			
9.	Define coherent sources			
10.	Define stationary waves and describe how they occur			
11.	Give the frequency and wavelength of a stationary wave			
12.	Stationary waves; give the relationship between inter-node distance and wavelength			
14.	Know what Doppler effect is and give applications of it			
15.	Perform calculations using the formula $f' = \frac{fc}{/(c \pm u)}$			
16.	Use the Doppler effect to explain the Red shift of stars, ultrasound, weather forecasting and Speed traps			

	Optics	Green light	Amber light	Red Light
	Laws of Reflection			
1.	Recall that light is a form of energy			
2.	Differentiate between luminous and non-luminous objects			
3.	Define reflection			
4.	State the Laws of reflection			

5.	Be able to represent the angle of incidence, the angle of reflection and the normal ray on a diagram			
6.	Perform an experiment to demonstrate the Laws of Reflection			
	Mirrors			
7.	Describe how an image is formed by plane and spherical mirrors			
8.	Recall that real is positive sign convention			
9.	Describe how a virtual image is formed			
10.	Perform simple exercises on mirrors by ray tracing or use the formulas $\frac{1}{u}+\frac{1}{v}=\frac{1}{f}$ Magnification $=\frac{height\ of\ image}{height\ of\ object}$ or $\frac{v}{u}$			
11.	Give practical uses of both concave and convex spherical mirrors			
12.	Describe how to locate an image in a plane mirror by method of no parallax			
13.	Draw diagrams of images formed in concave and convex mirrors			
14.	Perform an experiment to measure the focal length of a concave mirror			
	Laws of Refraction			
15.	Define Refraction			
16.	State the Laws of Refraction			
17.	Demonstrate refraction using a ray box or laser			
18.	Be able to represent the angle of incidence, the refracted ray and the normal ray on a diagram			
19.	Describe what happens when a light ray travels form one medium through another			
20.	Define the Refractive Index			
21.	Perform calculations to determine the refractive index of various substances			
22.	Perform an experiment to verify Snell's Law and hence measure the refractive index of Glass			
23.	Give practical examples of refraction eg: real and apparent depth of fish in water			
24.	**Define and calculate refractive index in terms of relative speed**			
	Total Internal Reflection			
25.	Demonstrate Total Internal Reflection			

26.	Define critical angle			
27.	State the relationship between the critical angle and the refractive index			
28.	Discuss the transmission of light through optical fibres			
29.	Discuss the use of total internal reflection in road signs, mirages, prism reflector			
30.	Discuss the use of optical fibres in medicine in telecommunications and medicine			
	Lenses			
31.	Show how images are formed by single thin lenses both convex and concave			
32.	Show using diagrams how the image changes as the position of the object changes			
33.	Perform simple exercises on lenses by ray tracing or use the formulas Magnification = $\frac{height\ of\ image}{height\ of\ object}$ or $\frac{v}{u}$ $\frac{1}{u}+\frac{1}{v}=\frac{1}{f}$			
34.	Recall that the power of a lens is $P = 1/f$			
35.	Perform calculations where two lenses are in contact using the formula $P_{Total} = P_1 + P_2$			
36	Perform calculations where two lenses are in contact using the formula $\frac{1}{F\ Total}=\frac{1}{F1}+\frac{1}{F2}$			
37.	Discuss the eye as an optical structure and the defects of long and short sightedness			
38.	Discuss how light is controlled when entering the eye and how images are formed on the retina			
39.	Define the power of accommodation			
40.	Discuss the use of spectacles to correct long and sort sightedness			
41.	Perform an experiment to measure the focal length of a convex lens			