

2021 National ATP: Grade 11 Term 1: TECHNICAL SCIENCES

Important notes

1. The content of the tables are CAPS aligned however the CAPS document must be used at all times for further details.
2. The formal assessment will consist of:
 - 2.1 Term 1 – Control test 1 (30% of SBA) & Formal experiment 1/PAT1 (40% of PAT)
 - 2.2 Term 2 – Control test 2 (40% of SBA) & Formal experiment 2/PAT2 (30% of PAT)
 - 2.3 Term 3 – Control test 3 (30% of SBA) & Formal experiment 3/PAT 3 (30% of PAT)
 - 2.4 Term 4 – End of the year examination (2 Papers)

TERM 1 (45 days)	Week 1 27 - 29 Jan (3 days)	Week 2 01 - 05 Feb (5 days)	Week 3 08 - 12 Feb (5 days)	Week 4 15 - 19 Feb (5 days)	Week 5 22 - 26 Feb (5 days)	Week 6 01 - 05 March (5 days)	Week 7 08 - 12 March (5 days)	Week 8 15 - 19 March (5 days)	Week 9 23 - 26 March (4 days)	Week 10 29 - 31 March (3 days)
CAPS Topics	<ul style="list-style-type: none"> MECHANICS: Revision of grade 10 content (3hrs) 	<ul style="list-style-type: none"> MECHANICS: Revision of grade 10 content (4hrs) 	<ul style="list-style-type: none"> MECHANICS: Introduction to Mechanics Sign conventions (4hrs) 	MECHANICS: Graphs (4hrs)	<ul style="list-style-type: none"> MECHANICS: Theorem of Pythagoras Co-linear vectors Co-planar vectors (4hrs) 	<ul style="list-style-type: none"> MECHANICS: Resultant of forces in two dimensions. Head-to-tail method Theorem of Pythagoras (4hrs) 	<ul style="list-style-type: none"> MECHANICS: Resultant of forces in two dimensions. Parallelogram of Forces (4hrs) 	<ul style="list-style-type: none"> MECHANICS: Resolution of forces into components (4hrs) 	<ul style="list-style-type: none"> MECHANICS: Frictional forces Static and kinetic frictional force (4hrs) 	Consolidation and revision. Control test 1 (1hr)
Topics /Concepts, Skills and Values	<ul style="list-style-type: none"> Vectors and scalars (Vectors, scalars, graphical representation of vectors) Motion in one dimension: (position, displacement, distance, speed, velocity, acceleration) Introduction of Force (Definition of force, contact force, non-contact force), 	<ul style="list-style-type: none"> Kinds of forces (Tension, normal force, force of gravity, frictional Force) Force diagram and free body diagram, Resultant and Equilibrant Equilibrium of forces in one dimension Energy (gravitational potential energy, kinetic energy, mechanical energy) 	<ul style="list-style-type: none"> Use the Cartesian coordinates system to indicate the directions (+ve X and +ve Y as positive). Use compass directions to indicate the directions. Express the direction using bearing by measuring on the north line in the clockwise direction to the vector. Use the above methods to determine the directions of vectors. 	<ul style="list-style-type: none"> Demonstrate the direct proportion graphs in the context of technology. Demonstrate the indirect proportion graphs in the context of technology. 	<ul style="list-style-type: none"> Determine the resultant of two vectors acting perpendicular to each other using the theorem of Pythagoras: $F_R^2 = F_1^2 + F_2^2$ Use the theorem of Pythagoras to calculate the resultant of forces, in the context of technology. Define co-linear vectors as vectors that have the same line of action. Define co-planar vectors as vectors that are in the same plane. Draw the resultant of two co-linear vectors. 	<ul style="list-style-type: none"> Use the head-to-tail method to determine the resultant of two vectors at right angles to each other. Use the theorem of Pythagoras to determine the resultant of forces acting at right angles to each other. 	<ul style="list-style-type: none"> The Parallelogram law of forces states that if two forces acting at a point can be represented by the adjacent sides of a parallelogram both in magnitude and direction, then the diagonal from the point gives the resultant of the two forces. Use the parallelogram law to determine the resultant of two forces acting at an angle to each other. Using scale drawing (Do not do calculations involving the resultant.) 	<ul style="list-style-type: none"> Resolution of forces: <ul style="list-style-type: none"> Given a force F acting at an angle to the horizontal axis, resolve the force into its parallel and perpendicular components. (use scale drawings) Given a force F acting at an angle to the horizontal axis, resolve the force into its parallel and perpendicular components. (use calculations) 	<ul style="list-style-type: none"> Frictional forces: <ul style="list-style-type: none"> Define frictional force as the force that opposes the motion of an object. The static (limiting) frictional force acts between the two surfaces when the object is stationary. It is given by $f_s = \mu_s F_N$ Use the above equation to solve problems involving frictional forces. (No inclined plane problems) The kinetic (dynamic) frictional force acts between the two surfaces when the object is moving. It is given by $f_k = \mu_k F_N$ Use the above equation to solve problems involving frictional forces. (No inclined plane problems) Experiment 2 (Informal) <ol style="list-style-type: none"> a) Determine the relation between the force of <i>limiting friction and the normal force.</i> b) Determine the coefficient of friction between a block and horizontal surface. 	Control test 1 (1hr) <ul style="list-style-type: none"> Signs and conversions Graphs Theorem of Pythagoras and its application Co-linear vectors Co-planar vectors Resultant of forces in two dimensions Resolution of forces into components Frictional forces
Requisite pre-knowledge			Graphical representation of vectors.	Basic skills on drawing and interpreting graphs.	Graphical representation of vectors. Working with formulae.	Graphical representation of vectors.	Graphical representation of vectors.	Graphical representation of vectors.	Graphical representation of vectors.	Graphical representation of vectors. Kinds of forces. Working with formulae

TERM 1 (45 days)		Week 1 27 - 29 Jan (3 days)	Week 2 01 - 05 Feb (5 days)	Week 3 08 - 12 Feb (5 days)	Week 4 15 - 19 Feb (5 days)	Week 5 22 - 26 Feb (5 days)	Week 6 01 - 05 March (5 days)	Week 7 08 - 12 March (5 days)	Week 8 15 - 19 March (5 days)	Week 9 23 - 26 March (4 days)	Week 10 29 - 31 March (3 days)
Resources (other than textbook) to enhance learning				Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Practical apparatus Simulations Videos	Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Practical apparatus Simulations Videos	
Assessment	Informal Assessment: Remediation	Homework	Homework	Homework Informal test	Homework	Homework	Homework Informal test			Homework	Homework Experiment 2
	SBA (Formal)	None	None	None	None		None	Formal Experiment 1 (PAT 1)	None	None	Control test 1 (1hr)

2020 National ATP: Grade 11 – Term 2: **TECHNICAL SCIENCES**

TERM 2 (51 days)	Week 1 13 – 16 April (4 days)	Week 2 19 – 23 April (5 days)	Week 3 28 – 30 April (3 days)	Week 4 3 – 7 May (5 days)	Week 5 10 – 14 May (5 days)	Week 6 17 – 21 May (5 days)	Week 7 24 – 28 May (5 days)	Week 8 31 May – 4 June (5 days)	Weeks 9 7 – 11 June (5 days)	Weeks 10 14 – 18 June (4 days)	Weeks 11 21 – 25 June (5 days)
CAPS Topics	MAGNETISM AND ELECTRICITY: Magnet and the magnetic field (4hrs)	MAGNETISM AND ELECTRICITY: The earth's magnetic field. (4hrs)	WAVES AND SOUND: Pulses (4hrs)	WAVES AND SOUND: Pulses (2hrs) Waves (2hrs)	WAVES AND SOUND: Waves (1hr) Wave terminology (3hrs)	WAVES AND SOUND: (4hrs)	WAVES AND SOUND: Sound waves (4hrs)	WAVES AND SOUND: (4hrs)	WAVES AND SOUND: (4hrs)	MATTER AND MATERIALS Electrical conductors, semiconductors and insulators. (Revision)	Consolidation, Revision and control test 2
Topics /Concepts, Skills and Values	<ul style="list-style-type: none"> Describe a magnet as an object that has a pair of opposite poles, called north and south. Even if the object is cut into tiny pieces, each piece will still have both a N and a S pole. Define the magnetic field as the region in space where another Magnet or ferromagnetic material will experience a force. Like magnetic poles repel each other and opposite poles attract each other. Use a compass to determine the direction of the magnetic field. Sketch the magnetic field of a bar magnet. Predict the behaviour of magnets when they are brought close together. Discuss the properties of magnetic field lines. 	<ul style="list-style-type: none"> Compare the magnetic field of the earth to the magnetic field of a bar magnet. Explain the difference between the geographical North pole and the magnetic North pole of the earth. Give examples of phenomena that are affected by earth's magnetic field e.g. Aurora Borealis (Northern Lights) & magnetic storms. Discuss qualitatively how the earth's magnetic field provides protection from solar winds. 	<ul style="list-style-type: none"> Define a pulse as a single disturbance in a medium. Define a transverse pulse as a pulse in which the particles of the medium vibrate at right angles to the direction of propagation of the pulse. Define a longitudinal pulse as a pulse in which the particles of the medium vibrate parallel to the direction of propagation of the pulse. 	<p>Pulses Experiment 6 (Spend 2hr) Observe the motion of a single pulse</p> <p>Waves (2 hr)</p> <ul style="list-style-type: none"> Define a wave as a succession of pulses. Define a transverse wave as a wave in which the particles of the medium vibrate at right angles to the direction of propagation of the wave. Draw the transverse wave. 	<ul style="list-style-type: none"> Define a longitudinal wave as a wave in which the particles of the medium vibrate parallel to the direction of propagation of the wave. Draw the longitudinal wave. Define amplitude as the maximum displacement of a particle from its rest (equilibrium) position. Define a crest as the uppermost point on a transverse wave. Define a trough as the lowermost point on a transverse wave. Define points in phase as any two points that are in the same state of vibration. Define wavelength (as the distance between two successive points in phase. SI unit: m Draw and label transverse and longitudinal waves. Define the period (T) as the time taken to complete one wave. SI unit: s Define frequency (f) as the number of waves per second. SI unit: hertz (Hz), Note: 1 Hz = 1 s⁻¹ 	<p>Relationship between period and frequency:</p> $T = \frac{1}{f}$ <ul style="list-style-type: none"> Use the above equation to solve problems involving period and frequency in the content of technology. <p>Wave speed:</p> <ul style="list-style-type: none"> Define wave speed as the distance travelled by the wave in one second. $V = \frac{\text{distance travelled}}{\text{time taken}}$ <p>or</p> $V = \frac{\lambda}{T} \text{ or } V = f\lambda$ <ul style="list-style-type: none"> Use the above equations to solve problems involving speed, wavelength and frequency, distance, time, in the content of technology. 	<p>Sound waves:</p> <ul style="list-style-type: none"> Sound waves are longitudinal waves. Investigate the speed of sound waves in different mediums (gas, liquid or solid). Define the reflection of sound waves as the bouncing back of the wave from a surface. Define an echo as the reflection of a sound wave. 	<ul style="list-style-type: none"> Define pitch as a measure of how high or low a note is. Frequency of sound determines its pitch. The higher the frequency, the higher the pitch. Loudness is determined by the amplitude of the sound. The higher the amplitude, the louder sound. Use wave patterns to demonstrate pitch and loudness. Infrasound: frequencies less than 20 Hz. Audible sound: frequencies from 20 Hz to 20 000 Hz. Ultrasound: frequencies greater than 20 000Hz. Application of infrasound and ultrasound related to technology. 	<p>Formal Experiments (PAT)</p>	<ul style="list-style-type: none"> Give examples of electrical conductors, semiconductors and insulators. Identify the substances and the appliances or objects, which are in common daily use in homes and offices, that are specifically chosen because of their electrical properties (conductors, insulators and semiconductors) 	<p>Control test 2 (1hr)</p> <ul style="list-style-type: none"> Magnet The magnetic field Poles of permanent magnet Direction of magnetic field Magnetic field of a bar magnet Force of a magnet Properties of magnetic field lines Earth's Magnetic Field Pulses Waves Wave terminology Sound waves

TERM 2 (51 days)		Week 1 13 – 16 April (4 days)	Week 2 19 – 23 April (5 days)	Week 3 28 – 30 April (3 days)	Week 4 3 – 7 May (5 days)	Week 5 10 – 14 May (5 days)	Week 6 17 – 21 May (5 days)	Week 7 24 – 28 May (5 days)	Week 8 31 May – 4 June (5 days)	Weeks 9 7 – 11 June (5 days)	Weeks 10 14 – 18 June (4 days)	Weeks 11 21 – 25 June (5 days)
Requisite pre-knowledge		Magnetic, non-magnetic and ferromagnetic material	Magnetic, non-magnetic and ferromagnetic material					Definitions of frequency and amplitude.	Definitions of frequency and amplitude.	Definitions of frequency and amplitude.		
Resources (other than textbook) to enhance learning		Question bank such as previous papers or study guides Practical apparatus Simulations Videos	Question bank such as previous papers or study guides Practical apparatus Simulations Videos	Question bank such as previous papers or study guides Practical apparatus Simulations Videos	Question bank such as previous papers or study guides Simulations Videos	Question bank such as previous papers or study guides Simulations Videos	Question bank such as previous papers or study guides	Question bank such as previous papers or study guides Simulations Videos	Question bank such as previous papers or study guides Simulations Videos	Question bank such as previous papers or study guides Simulations Videos		
Assessment	Informal Assessment: Remediation	Homework Experiment 3 (Informal) Determine the north pole of the earth using a bar magnet	Homework Experiment 4 (Informal) a) Determine whether a material is a magnetic <i>material or a magnet</i> . b) Determine the polarity of the magnets. Experiment 5 (Informal) <i>Mapping of magnetic field.</i>	Corrections of March control test Homework	Homework Experiment 6 (Informal): Observe the motion of a single pulse travelling along a long, soft spring or a heavy rope.	Homework Informal test	Homework	Homework	Homework Informal test		Homework Informal Experiment (Simulation, video or demonstration) Determine the electrical conductivity of different material.	
	SBA (Formal)			None	None	None	None	• None	• None	Formal Experiment (PAT 2)		Control test 2

2021 National ATP: Grade 11 – Term 3: **TECHNICAL SCIENCES**

TERM 3 (52 days)	Week 1 13 – 16 July (4 days)	Week 2 19 – 23 July (5 days)	Week 3 26 – 30 July (5 days)	Week 4 2 – 6 Aug (5 days)	Week 5 10 – 13 Aug (4 days)	Week 6 16 – 20 Aug (5 days)	Week 7 23 – 27 Aug (5 days)	Week 8 30 Aug-3 Sept (5 days)	Week 9 6 – 10 Sept (5 days)	Week 10 13 – 17 Sept (5 days)	Weeks 10 - 20 – 23 Sept (4 days)
CAPS Topics	ELECTRICITY & MAGNETISM Electrostatics Revision of Grade 10 content (1hr) Coulomb's Law (2hr)	ELECTRICITY AND MAGNETISM Electrostatics (4hrs)	ELECTRICITY AND MAGNETISM Electrostatics (4hrs)	ELECTRICITY AND MAGNETISM Electric circuits Revision of Grade 10 content	ELECTRICITY AND MAGNETISM Electric circuits (4hrs)	ELECTRICITY AND MAGNETISM Electric circuits (4hrs)	ELECTRICITY AND MAGNETISM Electric circuits (4hrs)	ELECTRICITY AND MAGNETISM Electric circuits (4hrs)	HEAT AND THERMODYNAMICS (4hrs)	HEAT AND THERMODYNAMICS (4hrs)	HEAT AND THERMODYNAMICS (2hrs) Control Test 3 (1hr)
Topics / Concepts, Skills and Values	<p>Two kinds of charge (1hr)</p> <ul style="list-style-type: none"> Explain that all materials contain positive charges (protons) and negative charges (electrons). Explain that an object which has an equal number of electrons and protons is neutral (no net charge). Explain that positively charged objects are electron deficient and negatively charged objects have an excess of electrons. <p>Coulomb's Law (2hrs)</p> <ul style="list-style-type: none"> Coulomb's Law states that the force of attraction or repulsion between two point charges is directly proportional to the product of their charges and inversely proportional to the square of the distance between the two charges. $F = \frac{kQ_1Q_2}{r^2}$ <p>Use the above equation to calculate the force and charge.</p>	<p>Electric field</p> <ul style="list-style-type: none"> Define the electric field as a region of space in which an electric charge experiences a force. $E = \frac{F}{Q}$ <ul style="list-style-type: none"> Use the above equation to calculate the force, charge and electric field. The direction of the electric field at a point is the direction that a positive test charge (+1C) would move if placed at that point. 	<p>Electric field lines</p> <ul style="list-style-type: none"> Draw electric field lines: <ol style="list-style-type: none"> Around a positive charge Around a negative charge Between a positive and a positive charge Between a negative and a negative charge Between a positive and a negative charge. Electric field between parallel plates. $E = \frac{V}{d}$ Do calculations by using the above equation. Discuss the relationship between E, V and d. Draw electric lines between two parallel plates. <p>Discuss application of electrostatics related to technology.</p>	<p>Components of electric circuit:</p> <ul style="list-style-type: none"> Draw the components of a circuit using appropriate circuit symbols. Give the meanings of all symbols used. <p>Current:</p> <ul style="list-style-type: none"> Define current, I. The unit for current is Ampere (A). Calculate the current using the equation $I = \frac{Q}{\Delta t}$ <ul style="list-style-type: none"> Direction of conventional current in circuit Define potential difference, Emf Give the difference between emf and potential difference. Emf and pd are measured in volts (V). Do calculations using the above equations. <p>Resistance</p> <ul style="list-style-type: none"> Define resistance and give a microscopic description of resistance in terms of electrons moving through a conductor and colliding with the particles of which the conductor (metal) is made and thereby transferring kinetic energy. State and explain factors that affect the resistance of a substance <p>Resistors in Series</p> $R_T = R_1 + R_2 + R_3$ $I_T = I_1 = I_2 = I_3$ $V_T = V_1 + V_2 + V_3 \dots$ <p>Resistors in parallel</p> $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ <ul style="list-style-type: none"> Alternatively, when we have two resistors in 	<p>Ohm's Law</p> <p>Ohm's law states that the current in a conductor is directly proportional to the potential difference across it, at constant temperature.</p> $V = IR$ <p>Use the above equation to do calculations (include graphical calculations).</p> <p>Experiment 10 – 2 hrs</p> <p>Determine the resistance of an unknown resistor.</p>	<p>Ohmic and non-Ohmic conductors:</p> <p>Any conductor that obeys Ohm's law is called an Ohmic conductor.</p> <p>Give examples of Ohmic conductors.</p> <ul style="list-style-type: none"> A conductor that does not obey Ohm's law is called non-Ohmic conductor. <p>Give examples of non-Ohmic conductors.</p> <p>Experiment 11 – 2 hrs</p> <p>Obtain current and voltage data for a piece of copper wire and semi-conductor and determine which one obeys Ohm's law.</p>	<p>Circuit calculations</p> <ul style="list-style-type: none"> Use series and parallel resistors in combination with Ohm's law. 	<p>Emf</p> <ul style="list-style-type: none"> Emf is defined as the potential difference across a cell when the circuit is open Define Internal resistance as the resistance inside the cell when current flows through it. <p>(No calculations needed)</p> <p>Experiment 12 – Determine the internal resistance of a battery.</p>	<p>Heat: Specific heat capacity</p> <ul style="list-style-type: none"> Define the specific capacity (c) of a substance as the amount of heat required to increase the temperature of 1 kg of the substance by 1°C or 1K. <p>SI unit: J kg⁻¹ K⁻¹</p> <p>Heat capacity</p> <ul style="list-style-type: none"> Define the heat capacity (C) of a substance as the amount of heat required to increase the temperature of the whole substance by 1°C or 1K <p>SI unit: JK⁻¹</p> <ul style="list-style-type: none"> C = cm where m is the mass of a substance. Use the above equation to do calculations. Discuss practical application of heat capacity in technology. <p>Law of conservation of heat</p> <ul style="list-style-type: none"> Law of conservation of heat states that the amount of heat lost equals the amount of heat gained, when no heat is lost. Amount of heat lost or gained is given by: 	<p>Experiment 13</p> <p><i>Determine the heat capacity of a solid.</i> (Materials: Calorimeter, thermometer, balance, lead or sand, water etc.)</p> <p>Thermodynamics</p> <ul style="list-style-type: none"> In thermodynamics we deal with the processes involving heat, work and energy. Define thermodynamic system as a portion of matter. E.g. Gas enclosed inside a cylinder, fitted with a piston. Define the surrounding as anything outside the system which has some bearing on the behaviour of the system. Define an open system as a system which can exchange matter and energy with the surroundings. Define a closed system as a system which can exchange energy only, not matter, with 	<p>First Law of Thermodynamics</p> <ul style="list-style-type: none"> The first law of thermodynamics states that if heat energy ΔQ is given to a system it is used in two ways: <ol style="list-style-type: none"> In increasing the internal energy of the system (ΔU) In doing work against external pressure. (ΔW). ΔQ = ΔU + ΔW Use the above equation to calculate the internal energy, work done and the amount of heat supplied. Define working substance as the substance that absorbs heat from the source. e.g. Air in petrol and diesel engines. Define heat engine as a device which converts heat energy into mechanical work. <p>Efficiency of heat engine</p> <ul style="list-style-type: none"> It absorbs heat from a hot body (source), converts a part of it into work and rejects the rest to a cold body (sink).

				<p>parallel we can use the formula.</p> $R_p = \frac{R_1 \times R_2}{R_1 + R_2}$ <ul style="list-style-type: none"> • $V_T = V_1 = V_2 = V_3, \dots$ • $I_T = I_1 + I_2 + I_3$ 					<p>$Q = mc\Delta t$ SI unit of specific heat capacity: $Jkg^{-1}K^{-1}$.</p> <ul style="list-style-type: none"> • Do calculations using the above equation. <p>Experiment 13</p> <ul style="list-style-type: none"> • Determine the heat capacity of a solid. (Materials: Calorimeter, thermometer, balance, lead or sand, water etc.) 	<p>the surroundings.</p> <ul style="list-style-type: none"> • Define an isolated system as a system which is not influenced by its surroundings. (No exchange of heat or energy with the surroundings). • The thermal state of a system is defined by its temperature (T), pressure (P) and volume (V). These quantities are called thermodynamic variables. • Define internal energy of a thermodynamic system as the sum of the kinetic and potential energies of all the molecules of the system. 	<p>Second law of thermodynamics</p> <p>Efficiency = $\frac{W}{Q_1}$</p> <p>(No calculation on efficiency of a heat engine)</p> <ul style="list-style-type: none"> • It is impossible to get a continuous supply of work from a body by cooling it to a temperature lower than the lowest of its surroundings. • It is the reverse of a heat engine. <p>Refrigerators:</p> <p>The working substance (coolant e.g. liquid ammonia, Freon etc.) absorbs heat from a cold body (freezer), with the help of an external agency (compressor) and rejects it to the hot body (atmosphere).</p> <p>Control Test 3 (1hr)</p> <ul style="list-style-type: none"> • Coulombs law • Electric fields • Electric field lines • Application of electrostatics • Electric circuits • Heat and Thermodynamics
Requisite pre-knowledge		Two kinds of charge and charge conservation.	Two kinds of charge	Two kinds of charge	Components of a circuit, current, potential difference, resistance, resistors in series, resistors in parallel.	Components of a circuit, current, potential difference, resistance, resistors in series, resistors in parallel.	Components of a circuit, current, potential difference, resistance, resistors in series, resistors in parallel.	Components of a circuit, current, potential difference, resistance, resistors in series, resistors in parallel.			
Resources (other than textbook) to enhance learning		Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Practical apparatus Simulations Videos	Question bank such as previous papers or study guides Practical apparatus Simulations Videos	Question bank such as previous papers or study guides Practical apparatus Simulations Videos	Question bank such as previous papers or study guides Practical apparatus Simulations Videos	Question bank such as previous papers or study guides	such as previous papers or study guides Practical apparatus Simulations Videos	Question bank such as previous papers or study guides

Assessment	Informal Assessment: Remediation		Homework	Informal test	Homework Informal test	Homework	Homework Experiment 11 Obtain current and voltage data for a piece of copper wire and semi-conductor and determine which one obeys Ohm's law	Homework	Homework	Homework	Homework Experiment 13 <i>Determine the heat capacity of a solid.</i> (Materials: Calorimeter, thermometer, balance, lead or sand, water etc.)	
	SBA (Formal)		None	None	None	None	None	Formal Experiment (PAT 3).	None	None	None	Control Test 3 (1hr)

2020 National ATP: Grade 11 – Term 4: TECHNICAL SCIENCES

TERM 4 (47 days)		Week 1 5 – 8 Oct (4 days)	Week 2 11 – 15 Oct (5 days)	Week 3 18 - 22 Oct (5 days)	Week 4 25 – 29 Oct (5 days)	Week 5 1 – 5 Nov (5 days)	Week 6 8 – 12 Nov (5 days)	Weeks 7 - 10 15 Nov – 8 Dec (18 days)
CAPS Topics		MATTER AND MATERIALS: Classification of matter <i>Revision of Grade 10 content</i>	MATTER AND MATERIALS: Classification of matter <i>Revision of Grade 10 content</i>	CHEMICAL CHANGE Oxidation and Reduction (4 hr)	CHEMICAL CHANGE Oxidation and Reduction (4 hr)	CHEMICAL CHANGE Oxidation and Reduction (4 hr)	CHEMICAL CHANGE Oxidation and Reduction (4 hr)	Consolidation, Revision and End of the year Examination
Topics /Concepts, Skills and Values		Classification of matter: <ul style="list-style-type: none"> Define a pure substance as a single type of material (elements or compounds). Define an element as the simplest type of a pure substance. Define a compound as a substance made up of two or more elements in the exact ratio. Classify substances as pure, compounds or elements. 	Naming of compounds <ul style="list-style-type: none"> Name compounds using the names of the elements from which they are made. Define the terms cation and anion. Identify cations and anions. List the common compound anion, only sulphate, carbonate, sulphite, hydroxide Molecular fomulae <ul style="list-style-type: none"> Use cations and anions to write formulae Balancing of equations Represent reactions in equations and balancing equations	<ul style="list-style-type: none"> Oxidation is defined as the loss of electrons. Give examples of oxidation 	<ul style="list-style-type: none"> Reduction is defined as the gain of electrons. Give examples of reduction 	<ul style="list-style-type: none"> An oxidizing agent is defined as a substance that undergoes reduction. A reducing agent is defined as a substance that undergoes oxidation. Rules for assigning oxidation numbers. Assign oxidation numbers in various molecules. Electrolysis is the decomposition of a substance when an electric current is passed through it. Cathode is the electrode where reduction takes place. Anode is the electrode where oxidation takes place. 	Experiment 15 <ul style="list-style-type: none"> <i>Electrolysis of a salt solution.</i> (Materials: Carbon electrodes, beaker, copper chloride, water, power source, connecting wires, switch, etc.) 	All content, concepts and skills as prescribed in the CAPS for terms 1- 4 except <ul style="list-style-type: none"> Superposition of waves Paper 1 (150 marks) <ul style="list-style-type: none"> Mechanics (48) Electricity and Magnetism (54) Waves, sound and light (48) Paper 2 (75 marks) <ul style="list-style-type: none"> Chemical Change (38) Heat and thermodynamics (37)
Requisite pre-knowledge				Structure of the atom (Atomic Number, mass number, The Periodic Table, electron configuration)	Structure of the atom (Atomic Number, mass number, The Periodic Table, electron configuration)	Structure of the atom (Atomic Number, mass number, The Periodic Table, electron configuration)		
Resources (other than textbook) to enhance learning				Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Videos	Question bank such as previous papers or study guides Practical apparatus Simulations Videos	
Assessment	Informal Assessment: Remediation			Homework	Homework	Informal test	Experiment 15 <ul style="list-style-type: none"> <i>Electrolysis of a salt solution.</i> 	
	SBA (Formal)			None	None	None	None	End of the year Examination