SCIENCE	
GRADE F	Examples
A pupil will:-	
Have some scientific factual knowledge	• Know some of the names of the organs in an animal and plant and their functions • Know the names of some elements in the Periodic table and distinguish between metal and non metal • Know the names of forms of energy and some conversions of energy in machines
Can communicate their knowledge in simple sentences	• Can write down a list of animal and plant characteristics MRS GREN • Can list the characteristics of metals and non metals • Using diagrams can label different forms of energy
Can test their knowledge by picking out answers from a number of possible answers	• Can complete questions 1-8 in a module test with 5/8 or more correct
Can use key words to complete sentences	• Can answer questions 1 & 2 in Internal assessment tests
Can follow written instructions, with help, to carry out a simple experiment safely	• Dissolving experiments involving solid and water • Using diagram, wiring up a simple circuit involving lamp, battery ammeter
May be able to plan, and carry out with help, an experiment safely	• How long a candle burns in beakers of different sizes • Investigating seed germination under different conditions
Use simple apparatus, clock, thermometer to take readings	• Time taken for magnesium to dissolve in acid • Measuring height, weight, and other physical characteristics • Investigating shiny & dull surfaces
Complete a results table given by the teacher	• Record the results of the above experiments clearly in a two column results table prepared by the teacher
Can see that some science is used in the world outside	• Understand that animals and plants can be bred to improve their characteristics • Understand the use of metals, limestone and plastics in life • Understand reusable and non reusable energy sources

GRADE C	Examples
A pupil will:-	
Have a wide range of scientific factual knowledge across the three subjects. Have a fair understanding of processes such as photosynthesis, chemical reactions, electricity, magnetism (electromagnetic spectrum) and forces. Have some knowledge of the different scientific theories in the various subjects and can relate their observations to aspects of the theories they have studied.	• Have a secure knowledge of the organs of plants and animals and at a cellular level • Know the arrangement of elements in the Periodic table and distinguish between the groups. Have a knowledge of atomic structure • Understand the relationships between different forms of energy and a secure knowledge of the changes which can occur in complex situations eg. a coal fired power station
Can communicate in writing using technical terms and key words with confidence	• Can explain the circulation of blood or the passages of nervous impulses in the body. • Can write a sequenced method for an experiment such as the extraction of a metal by reduction with carbon. • Can describe the life of a star in notes and diagrams
Can test their knowledge by answering multiple-choice questions with confidence	• Can answer the first 16 questions coring around 12/16 • Can answer structured questions and questions involving longer written answers
Know and understand many of the key words and use them with confidence	• Know the processes photosynthesis, & respiration and realise that one is the opposite of the other. • Understand the types of chemical reaction such as Thermal decomposition, neutralisation, electrolysis • Understand and explain Ohm's law and the relationship between resistance, current and voltage
Can follow written instructions without further assistance to set up simple experiments in safety	• Making a slide of plant cells • Extracting a metal • Wiring a three-pin plug
Can plan a simple experiment, recognising the variables to be controlled and those which might be changed and realise some of the safety issues	• The effect of different salt solutions on the osmosis in a potato • The rate of reaction of Magnesium in Different concentrations of Hydrochloric acid • The effect of resistance on the different lengths of resistance wire
Use apparatus, including ICT, to measure and take readings from your experiments	• Measuring cylinders, two decimal place balances, dropping pipettes, ammeter, voltmeters, heart monitors,

	temperature probes, data loggers. Stop clocks.
Design and complete a results table including column headings and units of volume, time, or current	• Include column headings, repeat readings, averages and units of measurement at the top of a column eg. current (amps) time (sec), volume (cm3)
Analyse results by drawing line graphs and interpreting the changes, which occur within the experiment, and explaining the changes using scientific theory	• Graphs for any of the above variables eg. time v concentration, amps v volts, Mass changes v concentration
Evaluate the experiments done and identify anomalous results. Account for them in terms of accuracy and suggest ways of improving an experiment to improve accuracy	• Make suggestions for improving any of the above experiments mentioned.
Know and understand the relevance of science to events outside in the world	• The effect of climate change and the factors, which are responsible for it • The use of technology in the development of cells and batteries • The use of polymers, their advantages and disadvantages • The advantages and disadvantages of nuclear power
GRADE A	
A pupil will:	
Have a detailed knowledge and understanding of scientific factual knowledge across three subjects. Have a detailed understanding of processes across all subjects. Have good knowledge and understanding of the different scientific theories in the various subjects and can use this knowledge to explain clearly what they observe.	• Understand cell structure including details of the nuclear material and how it controls the cells activity. • Have a detailed knowledge of the arrangements of elements in the periodic table, their atomic structure and be able to interpret atomic number, mass number and electron configuration • Have a detailed understanding of the electromagnetic spectrum and relate energy to wavelength and frequency. • Understand the relationship between resistance, current and voltage and can manipulate formula such as Ohm's Law to explain new situations. • Can use and manipulate formula, which allow them to calculate velocity and acceleration in new situations.
Can communicate in prose using detailed technical vocabulary with fluency and detailed knowledge of theories. Can communicate clearly abstract ideas about science.	• Explain in detail such concepts as homeostasis, osmosis, genetics or evolution • Be able to write and use chemical equations, calculating reacting masses and formula. • Be able to explain clearly ideas about

	the formation of the universe and have a clear knowledge of the different theories.
Can test their knowledge by answering multiple choice questions at Higher level	• Can complete all higher papers with confidence and score marks 16+/20
Pupils choose their own methods of collecting data at first hand, they can plan, carry out and present data collected in various ways appropriate to the task with little or no assistance. They can analyse data mathematically by graphs and calculation.	• They can gain high marks (5-6) on the Practical assessment in all areas of:- (i) Following instructions (ii) Collecting data (iii) Presenting results
Pupils can use secondary sources of information. They can separate fact from opinion and have a good knowledge of what is genuine scientific evidence and how it can be used to effectively explain things.	• The use of the Internet to gather information on such topics as The Human Genome Project, global warming or nuclear power.
Pupils can apply the knowledge gained in science lessons in a new and wider context. They can explain how science contributes to society and have the ability to deal with ethical issues.	• Topics such as the Use of Human Embryos, GM crops, nano technology, alternative energy, nuclear power, space technology.