

**Senior Phase – Grade 9**  
**Today Planning Pack**  
**TECHNOLOGY**

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## Work schedule for Today Technology – Grade 9

Term	Week	LOs & ASs	Module	Assessment	Resources
1	1-4	LO 1 Technological processes and skills LO 3 Technology, society and the environment	1: Technology, society and the environment	Informal and formal assessment	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Ruler Eraser Compasses Photocopies of grid paper A4 and A3 paper
1	5-6	LO 1 Technological processes and skills LO 2 Technological knowledge and understanding LO 3 Technology, society and the environment	2: Communicating with drawings	Informal and formal assessment	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil, coloured pencils, ruler, eraser, compasses Photocopies of grid paper A4 and A3 paper
1	7-8	LO 1 Technological processes and skills LO 2 Technological knowledge and understanding LO 3 Technology, society and the environment	3: More graphic techniques to describe technology ideas	Informal and formal assessment	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Pencil crayons Ruler Eraser Photocopy of grid paper
1	9-10	LO 1 Technological processes and skills LO 2 Technological knowledge and understanding LO 3 Technology, society and the environment	4: Materials and structures	Informal and formal assessment	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil, coloured pencils Eraser Ruler Contact glue
2	11-14	LO 1 Technological processes and skills LO 2 Technological knowledge and understanding LO 3 Technology, society and the environment	5: Processing food to increase its life span	Informal and formal assessment	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Eraser Ruler Fresh fruit Vegetable Meat Three pieces of scrap cardboard and plastic

2	15-18	<b>LO 1 Technological processes and skills</b> <b>LO 2 Technological knowledge and understanding</b> <b>LO 3 Technology, society and the environment</b>	<b>6: Processing to recycle materials</b>	Informal and formal assessment Test	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil, coloured pencils Ruler Eraser Plastic waste items
2	19-21	<b>LO 1 Technological processes and skills</b> <b>LO 2 Technological knowledge and understanding</b> <b>LO 3 Technology, society and the environment</b>	<b>7: Mechanical systems: Gears</b>	Informal and formal assessment	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Ruler Eraser
3	22-25	<b>LO 1 Technological processes and skills</b> <b>LO 2 Technological knowledge and understanding</b> <b>LO 3 Technology, society and the environment</b>	<b>8: Mechanical systems: Hydraulics</b>	Informal and formal assessment	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Ruler Eraser Syringe Plastic tubing Cardboard tray Water
4	26-29	<b>LO 1 Technological processes and skills</b> <b>LO 2 Technological knowledge and understanding</b> <b>LO 3 Technology, society and the environment</b>	<b>9: Electrical systems</b>	Informal and formal assessment	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil, coloured pencils Ruler, eraser Electric boards Resistors 3 leads A light-emitting diode A light-dependent resistor potentiometers A thermistor A multimeter A transistor A low voltage supply A fixed resistor Spst switch 4700 uF electrolytic capacitor
4	30-31	<b>LO 1 Technological processes and skills</b> <b>LO 2 Technological knowledge and understanding</b> <b>LO 3 Technology, society and the environment</b>	<b>10: Integrated systems</b>	Informal and formal assessment Test	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil, coloured pencils Ruler, eraser Double handed cork puller Materials to build a crane structure: metal strips, dowels Electric motors Gear systems, pulley Buzzer or LED

**Note:** You need to complete 1 formal assessment task per term for Technology. This work schedule shows all the opportunities for formal assessment.

## LESSON PLANS – Grade 9

### Chapter 1: Technology, society and the environment

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 8 hours</b>		<b>Weeks: 1 – 4</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Languages LO3 Natural Sciences LO2, 3 Life Orientation LO1
<b>LO3 Technology, society and the environment</b>	Indigenous Technology and Culture Impact of Technology Bias in Technology	
<b>Content/Knowledge:</b> <b>Technology, society and the environment:</b> <ul style="list-style-type: none"> <li>• Energy consumption</li> <li>• Energy conservation</li> <li>• Renewable resources of energy</li> <li>• Solar cookers</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p1	Activity 1: Identify the technology problem TG p2	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Ruler Eraser
<b>Lesson 1:</b> Our growing need for energy LB p2	Activity 2: Analyse the increase in energy consumption; read a graph TG p2	
<b>Lesson 2:</b> Energy solutions throughout history LB p3	Activity 3: Look at and compare energy solutions – how society meets its energy needs TG p3	
<b>Lesson 3:</b> The impact of high energy consumption LB p4	Activity 4: Answer questions about the impact of high energy consumption TG p4	
<b>Lesson 4:</b> Short-term solutions to the energy problem LB p6	Activity 5: Investigate more efficient ways to make a coal fire – read case study and do a practical activity to evaluate solutions TG p4 Activity 6: Identify electricity wastage and conservation in the home TG p5	
<b>Lesson 5:</b> Long-term solutions to the energy problem LB p10	Activity 7: Make and evaluate a solar cooker TG p6 Activity 8: Understand the technology used in solar cookers TG p6	
<b>Lesson 6:</b> Energy use in South Africa today LB p13	Activity 9: Identify and compare the impact of access or lack of access to electricity TG p7	
<b>Lesson 7:</b> Capability task LB p14	Investigate, design, make, evaluate and communicate: a solar cooker TG p8	
<b>Lesson 8:</b> Assessment LB p15	Assessment activity TG p9	
<b>Assessment:</b> <b>Type of assessment:</b> Formal assessment for Lessons 4, 7 and 8 Informal assessment: all other activities can be used for informal assessment <b>Form of assessment:</b> Rubric 1 for Lesson 4; rubric 3 for Lesson 7; memo (TG p9) for Lesson 8		<b>Reinforcement:</b> Look at types of stoves Interview older people about non-electrical cooking and about deforestation  <b>Expanded opportunities:</b> Research energy forms, solar energy designs and cooking methods
<b>Teacher reflection:</b>		

## LESSON PLANS – Grade 9

### Chapter 2: Communicating with drawings

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 4 hours</b>		<b>Weeks: 5 – 6</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Languages LO1, 5 Mathematics LO1, 3,4 Arts and Culture LO1 Natural Sciences LO1, 2
<b>LO2 Technological knowledge and understanding</b>	Structures	
<b>LO3 Technology, society and the environment</b>	Impact of Technology	
<b>Content/Knowledge:</b>		
<b>Drawing and graphic communication skills:</b>		
<ul style="list-style-type: none"> <li>• Isometric drawing</li> <li>• Orthographic drawing</li> <li>• Communicate design ideas</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p17	Activity 1: Identify the technology problem TG p11	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Ruler Eraser Compasses Photocopies of grid paper A4 and A3 paper
<b>Lesson 1:</b> Reading information from drawings LB p18	Activity 2: Read the case study and interpret relevant drawings TG p11 Activity 3 and Activity 4: Identify objects and read information from 2-D and 3-D drawings TG p12	
<b>Lesson 2:</b> Making 3-D drawings of objects LB p22	Activity 5 and Activity 6: Use an isometric grid to copy 3-D drawings TG p13 Activity 7: Change 2-D views into 3-D drawings TG p14 Activity 8: Draw, showing hidden details in drawings TG p15	
<b>Lesson 3:</b> Capability task LB p34	Investigate, design, make, evaluate and communicate: a storage structure TG p16	
<b>Lesson 4:</b> Assessment LB p35	Assessment activity TG p17	
<b>Assessment:</b>		<b>Reinforcement:</b>
<b>Type of assessment:</b> Formal assessment for Lessons 2, 3 and 4 Informal assessment: all other activities can be used for informal assessment		Revise drawing skills from Grade 7 and Grade 8 Revise tracing techniques
<b>Form of assessment:</b> Rubric 2 for Lesson 2; rubric 3 for Lesson 3; memo (TG p17) for Lesson 4		<b>Expanded opportunities:</b> Draw more 3D drawings
<b>Teacher reflection:</b>		

## LESSON PLANS – Grade 9

### Chapter 3: More graphic techniques to describe technology ideas

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 4 hours</b>		<b>Weeks: 7 – 8</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Languages LO5 Mathematics LO3 Arts and Culture
<b>LO2 Technological knowledge and understanding</b>	Systems and Control: <ul style="list-style-type: none"> <li>• Mechanical</li> <li>• Electrical</li> </ul>	LO1 Natural Sciences LO2 Life Orientation LO2
<b>Content/Knowledge:</b> <b>Drawings:</b> <ul style="list-style-type: none"> <li>• Additional techniques</li> <li>• Enhancing drawings</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p37	Activity 1: Identify the technology problem TG p20	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Pencil crayons Ruler Eraser Photocopy of grid paper
<b>Lesson 1:</b> Using notes and labels to add information to a drawing LB p38	Activity 2: Adding note and labels to a drawing TG p20	
<b>Lesson 2:</b> Using graphs and component tables to add information to a drawing LB p40	Activity 3: Add information using drawings and a component table TG p22	
<b>Lesson 3:</b> Using colour to add information to a drawing LB p42	Activity 4: Drawing shadows, using colour to show light and shade TG p22 Activity 5: Using colour to identify components TG p24	
<b>Lesson 4:</b> Capability task LB p47	Investigate, design, make, evaluate and communicate: a plan of a paved area TG p25	
<b>Lesson 5:</b> Assessment LB p48	Assessment activity TG p26	
<b>Assessment:</b> <b>Type of assessment:</b> Formal assessment for Lessons 4 and 5 Informal assessment: all other activities can be used for informal assessment <b>Form of assessment:</b> Rubric 3 for Lesson 4; memo (TG p 26) for Lesson 5		<b>Reinforcement:</b> Make and label simple drawings  <b>Expanded opportunities:</b> Read up more on 3D drawings
<b>Teacher reflection:</b>		

## LESSON PLANS – Grade 9

### Chapter 4: Materials and structures

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 4 hours</b>		<b>Weeks: 9-10</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Languages LO5 Mathematics LO1 Arts and Culture
<b>LO2 Technological knowledge and understanding</b>	Structures Processing	LO1 Natural Sciences
<b>LO3 Technology, society and the environment</b>	Indigenous Technology and Culture Impact of Technology	LO1, 2
<b>Content/Knowledge:</b> <b>Properties of materials:</b> <ul style="list-style-type: none"> <li>• Functions</li> <li>• Suitability</li> <li>• Forces</li> <li>• Reinforced concrete</li> <li>• Even and uneven loads</li> <li>• Static and dynamic loads</li> <li>• Stationary and moving loads</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p49	Activity 1: Identify the technology problem TG p28	Technology Today Grade 9 Learner's Book and Teacher's Guide
<b>Lesson 1:</b> Properties of materials LB p50	Activity 2: Identify different structures TG p28 Activity 3: Select appropriate materials for structures TG p29 Activity 4: Investigate corrosion and its prevention TG p29 Activity 5 and Activity 6: Identify galvanising products and ways of preventing corrosion TG p31 Activity 7 and Activity 8: Identify components of structures that need to be stiff or flexible, and how they can be stiffened TG p32 Activity 9: Find examples of stiff and flexible structures in structures TG p33 Activity 10: Test a cool drink can for stiffness TG p33 Activity 11: Look at flexible materials in indigenous housing TG p34 Activity 12 and Activity 13: Investigate hardness TG p35	Pencil Coloured pencils Ruler Eraser Contact glue
<b>Lesson 2:</b> Strength of materials LB p61	Activity 14: Identify, and calculate stress TG p35 Activity 15 and Activity 16: Investigate and compare tensile strength TG p36 Activity 17 and Activity 18: Look at reinforcement through beams and concrete TG p37	
<b>Lesson 3:</b> Types of load LB p65	Activity 19: Understand types of loads TG p39 Activity 20: Look at how bridges use design features to resist wind forces TG p39	
<b>Lesson 4:</b> Capability task LB p68	Investigate, design, make, evaluate and communicate: a catapult TG p40	
<b>Lesson 5:</b> Assessment LB p69	Assessment activity TG p41	
<b>Assessment:</b> <b>Type of assessment:</b> Formal assessment for Lessons 1, 4 and 5 Informal assessment: all other activities can be used for informal assessment <b>Form of assessment:</b> Rubric 1 for Lesson; rubric 3 for Lesson 4; memo (TG p41) for Lesson 5		<b>Reinforcement:</b> Revision of calculation  <b>Expanded opportunities:</b> Research bridges
<b>Teacher reflection:</b>		

## LESSON PLANS – Grade 9

### Chapter 5: Processing food to increase its lifespan

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 8 hours</b>		<b>Weeks: 11–14</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Languages LO5 Natural Sciences LO2 Life Orientation
<b>LO2 Technological knowledge and understanding</b>	Processing	LO1
<b>LO3 Technology, society and the environment</b>	Indigenous Technology and Culture Impact of Technology Bias in Technology	
<b>Content/Knowledge:</b>		
<b>Processing:</b>		
<ul style="list-style-type: none"> <li>• Ways of preserving</li> <li>• Extending life-span of food</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p71	Activity 1: Identify the technology problem TG p43	Technology Today Grade 9 Learner's Book and Teacher's Guide
<b>Lesson 1:</b> Increasing the life-span of food LB p72	Activity 2: Find out how much of our food has been preserved TG p43 Activity 3: Compare traditional methods of preserving food TG p44 Activity 4: Research the impact of food preservation technology TG p44	Pencil Coloured pencils Ruler
<b>Lesson 2:</b> Preserving food using refrigerating and freezing LB p74	Activity 5: Investigate the effect of temperature on the lifespan of food TG p45 Activity 6: Make and evaluate a cooling system TG p45	Eraser Three pieces of scrap cardboard and plastic
<b>Lesson 3:</b> Preserving food using high temperatures LB p76	Activity 7: Investigate the use of high temperatures to preserve food TG p46	Fresh fruit Vegetables Meat
<b>Lesson 4:</b> Preserving food through drying LB p76	Activity 8: Compare fresh and dried foods TG p47	
<b>Lesson 5:</b> Preserving food through irradiation LB p77	Activity 9: Look at issues of irradiation TG p47	
<b>Lesson 6:</b> Smoking food to increase its life span LB p78	Activity 10 and Activity 11: Make and evaluate smoked meat TG p48	
<b>Lesson 7:</b> Capability task LB p80	Investigate, design, make, evaluate and communicate: a food preservation method TG p50	
<b>Lesson 8:</b> Assessment LB p81	Assessment activity TG p51	
<b>Assessment:</b>		<b>Reinforcement:</b>
<b>Type of assessment:</b> Formal assessment for Lessons 2, 7 and 8 Informal assessment: all other activities can be used for informal assessment		Look at recipes
<b>Form of assessment:</b> Rubric 1 for Lesson 2; rubric 3 for Lesson 7; memo (TG p51) for Lesson 8		<b>Expanded opportunities:</b> Research the safety of irradiation
<b>Teacher reflection:</b>		

## LESSON PLANS – Grade 9

### Chapter 6: Processing to recycle materials

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 8 hours</b>		<b>Weeks: 15–18</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Languages LO5 Arts and Culture LO1, 4 Social Sciences (Geography)
<b>LO2 Technological knowledge and understanding</b>	Processing	LO3 Natural Sciences
<b>LO3 Technology, society and the environment</b>	Indigenous Technology and Culture Impact of Technology	LO3 Economic and Management Sciences LO 4
<b>Content/Knowledge:</b> <b>Recycling:</b> <ul style="list-style-type: none"> <li>• Recycled materials</li> <li>• Processing</li> <li>• Dealing with waste</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p83	Activity 1: Identify the technology problem TG p56	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Ruler Eraser Plastic waste items
<b>Lesson 1:</b> Recycling LB p84	Activity 2 and Activity 3: Investigate recycling as a solution; look at different case studies TG p56	
<b>Lesson 2:</b> Recycling paper LB p86	Activity 4: Investigate paper recycling TG p58 Activity 5: Make handmade paper TG p58	
<b>Lesson 3:</b> Recycling plastic LB p90	Activity 6, Activity 7 and Activity 8: Investigate and recycle plastic; design and make a recycled item TG p59	
<b>Lesson 4:</b> Recycling glass LB p93	Activity 9: Identify the technology process TG p61 Activity 10: Investigate glass recycling TG p61	
<b>Lesson 5:</b> Recycling steel LB p96	Activity 11 and Activity 12: Look at cooldrink can recycling TG p62	
<b>Lesson 7:</b> Capability task LB p98	Investigate, design, make, evaluate and communicate: a recycled product TG p63	
<b>Lesson 8:</b> Assessment LB p99	Assessment activity TG p64	
<b>Assessment:</b> <b>Type of assessment:</b> Formal assessment for Lessons 2, 7 and 8 Informal assessment: all other activities can be used for informal assessment <b>Form of assessment:</b> Rubric 1 for Lesson 2; rubric 3 for Lesson 7; memo (TG p64) for Lesson 8		<b>Reinforcement:</b> Find out more about collect-a-can  <b>Expanded opportunities:</b> Research recycling Investigate glass blowing
<b>Teacher reflection:</b>		

## LESSON PLANS – Grade 9

### Chapter 7: Mechanical systems: gears

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 6 hours</b>		<b>Weeks: 19 – 21</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Languages LO5 Mathematics LO1 Natural Sciences
<b>LO2 Technological knowledge and understanding</b>	Systems and Control: Mechanical	LO2 Life Orientation LO2
<b>LO3 Technology, society and the environment</b>	Indigenous Technology and Culture Impact of Technology	
<b>Content/Knowledge:</b> <b>Mechanical systems and control:</b> <ul style="list-style-type: none"> <li>• Mechanical systems</li> <li>• Gears</li> <li>• Gear ratio</li> <li>• Mechanical advantage</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p101	Activity 1: Identify the technology problem TG p68	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Ruler Eraser
<b>Lesson 1:</b> Gears and gearing LB p102	Activity 2: Identify gears in everyday life TG p68	
<b>Lesson 2:</b> Spur gears LB p102	Activity 3: Make and demonstrate drive and driven gears using model TG p69 Activity 4: Draw a systems diagram TG p69 Activity 5 and Activity 6: Calculate the velocity ratio of a gear train; calculate mechanical advantage and gear ratios for simple gears TG p70	
<b>Lesson 3:</b> Other types of gears LB p108	Activity 7: Identify gear systems TG p72 Activity 8: Make a sliding door TG p73	
<b>Lesson 4:</b> The impact of gears on our lives LB p111	Activity 9: Consider the impact of gears on society TG p74	
<b>Lesson 5:</b> Capability task LB p112	Investigate, design, make, evaluate and communicate: a toy with moving parts TG p75	
<b>Lesson 6:</b> Assessment LB p113	Assessment activity: TG p75	
<b>Assessment:</b> <b>Type of assessment:</b> Formal assessment for Lessons 3, 5 and 6 Informal assessment: all other activities can be used for informal assessment <b>Form of assessment:</b> Rubric for Lesson 3; rubric 3 for Lesson 5; memo (TG p75) for Lesson 6		<b>Reinforcement:</b> Revise calculations and equations  <b>Expanded opportunities:</b> Investigate design possibilities
<b>Teacher reflection:</b>		

## LESSON PLANS – Grade 9

### Chapter 8: Mechanical systems: hydraulics

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 8 hours</b>		<b>Weeks: 22 – 25</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Languages LO2, 4 Mathematics LO1 Natural Sciences
<b>LO2 Technological knowledge and understanding</b>	Systems and Control <ul style="list-style-type: none"> <li>• Mechanical</li> <li>• Electrical</li> </ul>	LO2
<b>LO3 Technology, society and the environment</b>	Indigenous Technology and Culture	
<b>Content/Knowledge:</b>		
<b>Mechanical systems and control:</b>		
<ul style="list-style-type: none"> <li>• Hydraulics</li> <li>• Mechanical advantage</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p115	Activity 1: Identify the technology problem TG p79	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Ruler Eraser Syringe Plastic tubing Cardboard tray Water
<b>Lesson 1:</b> Hydraulics LB p116	Activity 2: Find out about hydraulic systems TG p79	
<b>Lesson 2:</b> How a hydraulic system works LB p117	Activity 3: Investigate and make a hydraulic system TG p80 Activity 4: Investigate the effect of piston size TG p80	
<b>Lesson 3:</b> Transmitting forces in a hydraulic system LB p120	Discuss types of forces in the hydraulic system	
<b>Lesson 4:</b> Mechanical advantage of a hydraulic system LB p120	Activity 5: Calculate input and output forces and distances TG p81 Activity 6: Design a hydraulic system TG p82	
<b>Lesson 5:</b> Controlling hydraulic systems LB p122	Activity 7: Look at the impact of hydraulic systems on society and our lives TG p82	
<b>Lesson 6:</b> Advanced hydraulic systems LB p125	Discuss advanced hydraulic systems used in garages	
<b>Lesson 7:</b> Advantages and disadvantages of hydraulics LB p125	Discuss the advantages and disadvantages of hydraulics	
<b>Lesson 8:</b> Mechanical advantage in other machines LB p126	Activity 8: Calculate the mechanical advantage TG p83 Activity 9: Look at and discuss the impact of mechanical systems on society and our lives TG p84	
<b>Lesson 9:</b> Capability task LB p128	Investigate, design, make, evaluate and communicate: a model of a hydraulic lift TG p85	
<b>Lesson 10:</b> Assessment LB p129	Assessment activity	
<b>Assessment:</b>		<b>Reinforcement:</b>
<b>Type of assessment:</b> Formal assessment for Lessons 9 and 10 Informal assessment: all other activities can be used for informal assessment		Revise calculations and equations
<b>Form of assessment:</b> Rubric 3 for Lesson 9; memo (TG p86) for Lesson 10		<b>Expanded opportunities:</b> Design and develop your own hydraulic system
<b>Teacher reflection:</b>		

## LESSON PLANS – Grade 9

### Chapter 9: Electrical systems

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 8 hours</b>		<b>Weeks: 26 – 29</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Social Sciences (History) LO3 Natural Sciences LO1, 2
<b>LO2 Technological knowledge and understanding</b>	Systems and Control: Electrical	Mathematics LO2
<b>LO3 Technology, society and the environment</b>	Impact of Technology Bias in Technology	
<b>Content/Knowledge:</b> <b>Electrical systems and control:</b> <ul style="list-style-type: none"> <li>• Electrical systems</li> <li>• Current</li> <li>• Circuits</li> <li>• Resistors</li> <li>• Components</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p131	Activity 1: Identify the technology problem TG p88	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil, coloured pencils Ruler, eraser Electric boards Resistors 3 leads A light-emitting diode A light-dependent resistor potentiometers A thermistor A multimeter A transistor A low voltage supply A fixed resistor Spst switch 4700 uF electrolytic capacitor (see TG pxxi)
<b>Lesson 1:</b> Control circuit outputs with different kinds of switches LB p132	Activity 2: Review systems: electrical circuits TG p88 Activity 3: Assemble circuits with outputs controlled by spdt switches TG p89 Activity 4, Activity 5: Identify and operate reed and push switches TG p90	
<b>Lesson 2:</b> Basic electrical quantities LB p135	Activity 6: Investigate currents in a bulb TG p91	
<b>Lesson 3:</b> Resistors in circuits LB p136	Activity 7: Decode the colour codes of resistors TG p92 Activity 8, Activity 9: Examine and use a potentiometer as a variable resistor TG p92 Activity 10: Find out where variable resistors are used TG p94	
<b>Lesson 4:</b> The electronic age LB p140	Activity 11: Understand the development of electronics TG p94	
<b>Lesson 5:</b> Electronic components LB p141	Activity 12, Activity 13, Activity 14: Investigate a light-emitting diode, LDRs, thermostats and transistors TG p95 Activity 15: Investigate how transistors work as switches TG p96 Activity 16: Convert decimal to binary numbers TG p97 Activity 17: Identify circuit components TG p98 Activity 18, Activity 19: Follow instructions to make and carry out observations TG p98	
<b>Lesson 6:</b> Electronic circuits LB p148	Activity 20, Activity 21: Follow instructions to make and carry out observations TG p98	
<b>Lesson 7:</b> Capability task LB p150	Investigate, design, make, evaluate and communicate: a security system for a model house TG p100	
<b>Lesson 8:</b> Assessment LB p151	Assessment activity TG p101	
<b>Assessment:</b> <b>Type of assessment:</b> Formal assessment for Lessons 7 and 8 Informal assessment: all other activities can be used for informal assessment <b>Form of assessment:</b> Rubric 3 for Lesson 7; memo (TG p101) for Lesson 8		<b>Reinforcement:</b> Draw and revise symbols  <b>Expanded opportunities:</b> Do calculations using Ohm's Law
<b>Teacher reflection:</b>		

## LESSON PLANS – Grade 9

### Chapter 10: Integrated systems

<b>Learning Areas: Technology</b>		<b>Grade: 9</b>
<b>Duration: 4 hours</b>		<b>Weeks: 30 - 31</b>
<b>Learning Outcome</b>	<b>Assessment Standards</b>	<b>Integration</b>
<b>LO1 Technological processes and skills</b>	Investigates Designs Makes Communicates Evaluates	Languages LO2, 5 Natural Sciences LO2
<b>LO2 Technological knowledge and understanding</b>	Structures Systems and Control: <ul style="list-style-type: none"> <li>• Mechanical</li> <li>• Electrical</li> </ul>	
<b>LO3 Technology, society and the environment</b>	Impact of Technology Bias in Technology	
<b>Content/Knowledge:</b> <b>Integrated systems and control:</b> <ul style="list-style-type: none"> <li>• Mechanical and electrical systems</li> </ul>		
<b>Learning activities</b>	<b>Teaching methods/approach</b>	<b>Resources</b>
<b>Lesson:</b> Introduction LB p153	Activity 1: Identify the technology problem TG p153	Technology Today Grade 9 Learner's Book and Teacher's Guide  Pencil Coloured pencils Ruler Eraser Double-handed cork puller Materials to build a crane structure Metal strips Dowels Electric motors Gear systems Pulley Buzzer or LED
<b>Lesson 1:</b> Machines LB p154	Activity 2 and Activity 3: Identify everyday machines and discuss their impact TG p103	
<b>Lesson 2:</b> Simple integrated systems LB p155	Activity 4, Activity 5 and Activity 6: Analyse and draw a systems diagram of an integrated system, and a car window-winder TG p104 Activity 7: Think about and analyse mechanisms in a food mixer TG p106	
<b>Lesson 3:</b> Analysing a mechanical device LB p158	Activity 8, Activity 9: Think about and analyse mechanisms in an electric hairdryer and pop-up toaster TG p107	
<b>Lesson 4:</b> Capability task LB p162	Investigate, design, make, evaluate and communicate: a model of a dockside crane TG p109	
<b>Lesson 5:</b> Assessment LB p163	Assessment activity TG p110	
<b>Assessment:</b> <b>Type of assessment:</b> Formal assessment for Lessons 4 and 5 Informal assessment: all other activities can be used for informal assessment <b>Form of assessment:</b> Rubric 3 for Lesson 4; memo (TG p110) for Lesson 5		<b>Reinforcement:</b> Revise system diagrams  <b>Expanded opportunities:</b> Design a warning light that is able to switch on automatically
<b>Teacher reflection:</b>		

## **RUBRIC 1: Practical test/model making**

<b>Activity:</b>		<b>Name:</b>					
<b>Date:</b>		<b>Grade:</b>					
	<b>Level 7</b> An excellent achievement far exceeding expected requirements	<b>Level 6</b> A very good achievement where all requirements have been met at a very high standard	<b>Level 5</b> A good achievement meeting most of the requirements	<b>Level 4</b> A fair achievement meeting an adequate portion of the requirements	<b>Level 3</b> A moderate achievement partially satisfying the requirements	<b>Level 2</b> An elementary achievement marginally satisfying the requirements	<b>Level 1</b> Unsatisfactory achievement. Requirements not met
<b>Recognise and understand key concepts and ideas</b>							
<b>Follow instructions; measure accurately</b>							
<b>Work safely and neatly</b>							
<b>Evaluate and experiment in a scientific way</b>							
<b>Draw conclusions giving reasons</b>							

**RUBRIC 2: Visual presentation (drawing; poster; collage; mind map)**

<b>Activity:</b>				<b>Name:</b>			
<b>Date:</b>				<b>Grade:</b>			
	<b>Level 7</b> Excellent achievement far exceeding expected requirements	<b>Level 6</b> A very good achievement where all requirements have been met at a very high standard	<b>Level 5</b> A good achievement meeting most of the requirements	<b>Level 4</b> A fair achievement meeting an adequate portion of the requirements	<b>Level 3</b> A moderate achievement partially satisfying the requirements	<b>Level 2</b> An elementary achievement marginally satisfying the requirements	<b>Level 1</b> An unsatisfactory achievement. Requirements not met
<b>Presentation /Appearance</b>	Exceptionally eye-catching; outstandingly creative; neat	Eye-catching; creative; neat	Attractive; fairly creative and neat	Merely presentable; little creativity; untidy	Visually unappealing and sloppy	Slapdash presentation messy	Activity misunderstood or incomplete
<b>Information</b>	Expresses excellent evidence of topic; accurate in scale	Good clear evidence of topic; factually correct scale	Some reasonable ideas and evidence of topic; mostly correct scale	Some evidence of topic; merely adequate presentation of scale	No clear ideas; little accuracy or detail	No clear ideas expressed; inaccurate scale and detail	
<b>Depth of understanding</b>	Shows maturity and great insight into drawing techniques	Shows some maturity and insight into drawing techniques	Shows partial maturity and insight into drawing techniques	Shows little maturity and insight into drawing techniques	No evidence of insight or maturity into drawing techniques	No insight or evidence of care or thoughtfulness into drawing techniques	

**RUBRIC 3: Capability task (LO1; LO2; LO3)**

Activity:		Name:					
Date:		Grade:					
	<b>Level 7</b> Excellent achievement far exceeding expected requirements	<b>Level 6</b> A very good achievement where all requirements have been met at a very high standard	<b>Level 5</b> A good achievement meeting most of the requirements	<b>Level 4</b> A fair achievement meeting an adequate portion of the requirements	<b>Level 3</b> A moderate achievement partially satisfying the requirements	<b>Level 2</b> An elementary achievement marginally satisfying the requirements	<b>Level 1</b> Unsatisfactory achievement. Requirements not met
<b>Investigate</b>							
<b>Design</b>							
<b>Make</b>							
<b>Evaluate</b>							
<b>Communicate</b>							
<b>Technological knowledge &amp; understanding</b>							
<b>Technology, society and environment</b>							