



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

Curriculum and Assessment Policy Statement: Technical Occupational

Year 1- 4

CIVIL TECHNOLOGY:

PLUMBING

PUBLIC COMMENT

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PUBLIC COMMENT

SECTION 1:

INTRODUCTION TO THE CURRICULUM AND ASSESSMENT POLICY STATEMENT: TECHNICAL OCCUPATIONAL

1.1 Background

The South African Constitution, Act 108 of 1996, enshrines the right of every child to access quality basic education without there being any form of discrimination. There are learners participating in the General Education and Training Band who have an interest and talent in applied knowledge and in technical and vocational skills subjects which are currently not available in the National Curriculum Statement, Grades R to 12 (2011). This cohort of learners should be given an opportunity to achieve a formal qualification or recognition of achievement towards a qualification that is related to any vocational and occupational learning within their area of interest and aptitude.

This Subject Statement has been developed to respond more effectively to the needs of these learners who have been identified and assessed through the protocols approved by the Department of Basic Education and who will benefit from curriculum content that is aligned to the Senior Phase of the National Curriculum Statement at a more applied and functional level in accordance with their interest and aptitude.

It is critical, that through differentiated methodologies, the learners enrolled for this qualification will be able to progress with regard to applied competencies, even where they might not be able to attain the minimum theoretical requirements of the respective grades of the senior phase. There should always be high expectations for all learners and the necessary scaffolding and learning support to master foundational competencies (language and numeracy) relevant to the specific subject, so that they are in a position to demonstrate the practical competencies that they have mastered which will make it possible for them to progress to further education and training pathways.

The learning programme will be structured in such a way that it would adequately prepare learners to progress onto the academic, technical vocational or technical occupational pathways of the Further Education and Training Band, albeit with endorsement. It will also enable learners across the range of competencies and aptitudes to obtain a recognised and accredited qualification or certificate of attainment.

The programme aims at contributing to the ideal of education to produce learners who will function **meaningfully** and **effectively** in the society, be able to enter future **careers** and be equipped to meet the requirements of the **economy** (local and global).

1.2 Overview

Through the policy document the Minister of Basic Education will be able to prescribe the minimum norms and standards for technical occupational education in the General Education and Training band.

The following legal framework will be adhered to:

- (i) National Curriculum Statement, Grades R to 12 (2011) together with the National Protocol for Assessment and the National Policy pertaining to the Programme and Promotion Requirements of the National Curriculum Statement, Grades R to 12;
- (ii) Draft Technical Vocational Subject Statements listed in the Draft General Certificate of Education: Technical Occupational, a Qualification at Level 1 on the National Qualification Framework;
- (iii) General and Further Education and Training Quality Assurance Act, 2001 (Act No.58 of 2001); the General and Further Education and Training Amendment Act, 2008 (Act No 50 of 2008); the NQF Act, 2008 (Act no 67 of 2008) and the Continuing Education and Training Act, 2006 as amended by Act No 3 of 2012 and Act No 1 of 2013;
- (iv) The General and Further Education and Training Qualifications Sub- Framework (August 2013);
- (v) Standards and quality assurance for General and Further Education and Training (June 2008, Revised April 2013);
- (vi) Policy and regulations pertaining to the conduct, administration and management of assessment for the General Education and Training Certificate in Skills and Vocational Training: A qualification at Level 1 on the National Qualification Framework (NQF);
- (vii) Education White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001);

- (viii) The United Nations Convention on the Rights of Persons with Disabilities adopted by the United Nations General Assembly on 13 December 2006 and ratified by the South African parliament on 5 June 2007;
- (ix) The White Paper on the Rights of Persons with Disabilities, 2015;
- (x) Section 11 of the Children's Act (2007);
- (xi) Chapter 5, section 76 of the Children's Act as amended (2007);
- (xii) Umalusi's Quality Assurance of Assessment: Directives, Guidelines and Requirements;
- (xiii) Skills Development Act, 1998 (Act 97 of 1998); and
- (xiv) Assessment Policy for Qualifications and Part Qualifications on the Occupational Qualifications Sub-Framework (OQSF), 2014 of the QCTO.

1.3. General Aims of the Technical Occupational Curriculum

- (a) The National Curriculum Statement, Grades R to 9 gives expression to the knowledge, skills and values worth learning in South African schools. The Technical Occupational Curriculum aims to ensure that learners, irrespective of their abilities, have the opportunity to develop competences for meeting challenges and taking up opportunities in the fast changing 21st century and are also guided to apply knowledge and skills in ways that are meaningful to their own lives. In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives, including the demands of the fourth industrial revolution. Sustaining development-relevance in the face of constant and rapid change requires curricula to be lifelong learning systems in their own right, capable of constant self-renewal and innovation.
- (b) The curriculum serves the purposes of:
 - Equipping learners, irrespective of their socio-economic background, race, gender, physical ability or intellectual ability, with the knowledge, skills and values necessary for self-fulfilment, and meaningful participation in society as citizens of a free country;
 - Promoting critical thinking, creativity and innovation, communication, collaboration, information, media and ICT literacies, flexibility and adaptability, initiative and self-direction, social and cross-cultural, productivity and accountability, leadership and responsibility and life-long learning;
 - Facilitating the transition of learners from education institutions to the workplace;

- Providing employers with a sufficient profile of a learner's competences.
- Being sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, and other factors;
- Valuing indigenous knowledge systems: acknowledging the rich history and heritage of this country as important contributors to nurturing the values contained in the Constitution; and
- Credibility, quality and efficiency: providing an education that is comparable in quality, breadth and depth to those of other countries.

(c) The curriculum is based on the following principles:

- Social transformation: ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of the population;
- Active and critical learning: encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths;
- High knowledge and high skills: the minimum standards of knowledge and skills to be achieved at each grade are specified and set high, achievable standards in all subjects;
- Progression: content and context of each grade shows progression from simple to complex; and
- Human rights, inclusivity, environmental, gender and social justice and equality: infusing the principles and practices of social justice and human rights as defined in the Constitution of the Republic of South Africa as well as the greening of the economy.

(d) Inclusivity should become a central part of the organisation, planning and teaching at each school. This can only happen if all teachers have a sound understanding of how to recognise and address barriers to learning, and how to plan for diversity. The key to managing inclusivity is ensuring that barriers are identified and addressed by all the relevant support structures within the school community, including teachers, District-Based Support Teams, School-based Support Teams, parents and Special Schools as Resource Centres. To address barriers in the classroom, teachers should use various curriculum differentiation strategies such as those included in the Department of Basic Education's Guidelines for Responding to Learner Diversity in the Classroom (2011), as well as the Standard Operating Procedures for Accommodations in Assessment (2016).

1.3.1. The aims of the General Certificate of Education: Technical Occupational

The specific aims of the qualification are to:

- Give recognition to learners who would meet the requirements and achieve the competencies as specified in the Exit Level Outcomes and associated Assessment Criteria as set out in the GFETQSF along differentiated pathways;
- Provide a foundation of quality, standardised general education which will suit the needs of these learners and help prepare them for life after school and enable them to access particular employment or occupational workplace-based learning. It may also enable the learners to access a vocational qualification at a Technical and Vocational Education Training College;
- Promote Lifelong learning to enable learners to continue with further learning and skills development in the workplace;
- Prepare learners to function better in a fully inclusive society and workplace; and
- Provide employers with a profile of the learner's competence.

Learners successfully completing the qualification will be able to:

- Identify, select, understand and apply knowledge to the intended purpose and identify solutions to problems in the field of study;
- Demonstrate the necessary applied knowledge and skills identified for competence in a subject, as specified in the subject statement;
- Demonstrate knowledge and skills gained for purpose of formal communication and basic numerical operations;
- Have the ability to apply knowledge and skills in changing contexts;
- Reflect on their learning in order to promote an interest in learning and further study; and
- Demonstrate basic entrepreneurial skills that will enable them to create their own work and business opportunities in the contexts in which they live.

1.4. Subjects and Time Allocation

Instructional Time for the Technical Occupational Learning Programmes is 27½ hours in a five-day cycle

Subjects		Time	
General Education			
Languages (Home Language and First Additional Language)		3 Hours for Home Language	
All 11 official languages (Afrikaans, English, isiNdebele, isiXhosa, isiZulu, Siswati, Sesotho, Setswana, Sepedi, Tshivenda, Xitsonga)		2 hours for First Additional Language	
Mathematics		3 hours	
Life Skills	Personal and Social Well-being (including aspects of Life Orientation, Social Sciences and Economic and Management Sciences)	2½ hours	6 hours
	Physical Education	1 hour	
	Creative Arts	1 hour	
	Natural Sciences	1½ hours from year 2 onwards This time to be used in year 1 to support Languages and Mathematics	
Information Communication Technology ICT is a compulsory subject for all learners. It can be offered either as a stand-alone or integrated across various subjects. If offered as a stand-alone a school may use time allocated to the Technical Occupational programme. ICT does not count towards the qualification but is a necessary life-long skill. ICT is not to be confused with the Technical Occupational Subject “Office Administration” which is an elective.			

Subjects	Time
Technical Occupational: Electives	
Agricultural Studies Art and Crafts Civil Technology: Bricklaying and Plastering Civil Technology: Plumbing Civil Technology: Woodworking and Timber Consumer Studies: Food Production Consumer Studies: Sewing Early Childhood Development Electrical Technology: Electrical Hospitality Studies Mechanical Technology: Body Works: Panel Beating and or Spray Painting Mechanical Technology: Motor Mechanics Mechanical Technology: Sheet Metal Work Mechanical Technology: Welding Mechanical Technology: Maintenance Office Administration Personal Care: Ancillary Health Care Personal Care: Beauty and Nail Technology Personal Care: Hairdressing Service Technology: Upholstery Wholesale and Retail	13½ hours
Total: General and Occupational	27½

The table below proposes the learner progression across the years at a School of Skills.

Year 1 Minimum of 1 year of orientation	Year 2	Year 3	Year 4
<p>Base Line Assessment for Language and Mathematics</p> <p>➤ Intervention (ISP)</p> <p>General Education:</p> <ul style="list-style-type: none"> • Home Language • FAL • Mathematics • Life Skills: <ul style="list-style-type: none"> ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts <p>➤ <u>ICT Enrichment</u></p> <p>Technical Occupational Minimum 2 x SKILLS Across the year</p> <p>Post Assessment</p> <ul style="list-style-type: none"> • Analyse results <p>Progress to Year 2 with appropriate support for Languages and Mathematics</p>	<p>General Education:</p> <ul style="list-style-type: none"> • Home Language • FAL • Mathematics • Life Skills: <ul style="list-style-type: none"> ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences <p>➤ <u>ICT Enrichment</u></p> <p>Technical Occupational Minimum of 1 Skill</p>	<p>General Education:</p> <ul style="list-style-type: none"> • Home Language • FAL • Mathematics • Life Skills: <ul style="list-style-type: none"> ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences <p>➤ <u>ICT Enrichment</u></p> <p>Technical Occupational Minimum of 1 Skill</p>	<p>General Education:</p> <ul style="list-style-type: none"> • Home Language • FAL • Mathematics • Life Skills: <ul style="list-style-type: none"> ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences <p>➤ <u>ICT Enrichment</u></p> <p>Technical Occupational Minimum of 1 Skill</p> <p>GCE: TO Qualification Or Certificate of Achievement</p> <p>(External exam- results verified / moderated)</p>

Note:

Year One is an orientation year and learners must be exposed to a minimum of two occupational skills so that they can select a skill with which they will continue from Year Two. Schools that offer more than the minimum two skills in Year One may adapt the Annual Teaching Plan for Year One to accommodate their rotation system to expose learners to more skills e.g. schools may offer a skill per term for Terms 1, 2 and 3 and learners then select the skill they will specialise in and start it in Term 4. It is important that learners in Year One experience the core competencies of the skills so that an informed choice can be made.

Years Two, Three and Four are the critical years for learners. It is important that learners are exposed to all the Topics and Specific Aims per selected Occupational skill, acknowledging that not all learners will be successful in all of these.

SECTION 2:

INTRODUCTION TO CIVIL TECHNOLOGY: PLUMBING

2.1 What is Plumbing?

Plumbing is the manipulation of water through a network of pipes performing different functions in systems such as hot and cold water, filtration, sewerage water removal and the installation of geysers, solar water heaters & heat pumps.

Skilled tradesmen work with pipes, valves and fittings which deliver potable water to buildings and remove grey (basin shower & bath water) and black water (toilets, sewerage & factory water). When installing new systems or modernising old ones, plumbers take measurements and make drawings to show where pipes will connect with outside lines and where fixtures will be placed. They then measure, bend, cut and thread pipes according to the drawings. Pipes are joined by bolting, brazing, gluing, screwing or soldering them together. In some cases, plumbers also repair roof gutters. When doing repair or maintenance work, plumbers must locate the cause of problems and replace broken or worn out valves and clear pipes and waste traps.

2.2 Topics to be studied in Plumbing

1. Safety
2. Water cycle
3. Water supply
4. Tools & Equipment
5. Material
6. Fittings
7. Hot water cylinders (geysers) SANS10254
8. Valves
9. Connecting pipes
10. Freehand drawings
11. South African National standards (SANS)
12. Calculations System International-(SI) Units
13. Measuring
14. Solar hot water Heaters SANS10106
15. Heat pumps SANS 1352
16. Soldering

17. Flushing systems
18. Installations of Sanitary units and showers
19. Sewerage
20. Planning and preparation of plumbing works
21. Galvanized sheet metal work
22. Maintenance repairs and replacement of gutters and downpipes
23. Maintenance & repairs
24. Invoices and quotations

2.3 Specific Aims:

The learner is able to:

1. Comply with good housekeeping safety practices in the work area
2. Explain the Water cycle in different systems
3. Explain the Water supply in different systems
4. Demonstrate the safe use of suitable Tools & Equipment
5. Identify and select suitable material for different water systems
6. Identify and select suitable fittings for different water systems
7. Install a Hot water cylinder (geysers) SANS10254
8. Identify and select suitable valves for different water systems
9. Identify and select suitable connecting pipes for different water systems
10. Illustrate layout of water systems using suitable freehand drawings
11. Comply with various SANS when installing water systems
12. Complete calculations using System International-(SI) Units
13. Demonstrate and apply accurate measuring techniques
14. Install Solar hot water Heaters SANS10106
15. Install Heat pumps SANS 1352
16. Demonstrate soldering techniques
17. Explain and demonstrate flushing systems
18. Install sanitary units and showers
19. Explain and install sewerage systems
20. Plan and prepare for plumbing works
21. Demonstrate basic Galvanized sheet metal work
22. Maintain, repair and replace gutters and downpipes
23. Maintain and repairs water systems
24. Complete invoices and quotations

NOTE: SANS:

- SANS 10254(the installation maintenance, replacement and repair of fixed electrical storage water heating systems)
- 10252-1 (water supply and drainage for building part 1: water supply installation for building)
- 10252-2 (part 2: drainage installation for building)
- 10400 (the application of building regulation)
- 10106 (solar water heaters)
- 1356 (fixed electrical instantaneous water heaters)

• NOTE: Relevant Standard Bodies and Regulations:

- JASWIC (Joint Acceptance Scheme Water Installation Components)
- PIRB (Plumbing Industry Registration Board)
- NRCS (National Regulator for Compulsory Specifications)
- Agreement South Africa
- Consumer Protection Act
- Comply with good housekeeping and with safety regulation.

2.4 Requirements for Plumbing as a subject

2.4.1 Time Allocation

The total number of hours allocated for the subject in a five-day cycle is 13 ½ hours. Sufficient time must be allocated in the school timetable for the practical work required.

2.4.2 Resources

Human resources

Plumbing requires a trained subject specialist. It is preferred that the teacher offering Plumbing is an artisan / technician / technical teacher in a Plumbing related area. Industry related experience and workshop management skills are essential and a tertiary qualification in technical teaching is preferred.

Plumbing teachers are required to:

- ☐ Teach the subject content with confidence and flair
- ☐ Interact with learners in a relaxed but firm manner

- ☐ Manage the workshop resourcing, budget and safety
- ☐ Manage the teaching environment
- ☐ Conduct stock taking and inventory
- ☐ Plan for practical work
- ☐ Plan for theory lessons
- ☐ Conduct weekly practical sessions
- ☐ Maintain and service the workshop as a whole
- ☐ Maintain and service the tools and instruments
- ☐ Ensure learner safety
- ☐ Produce working PAT projects in cooperation with learners
- ☐ Carry out School Based Assessment (SBA)
- ☐ Implement innovative methods to keep the subject interesting
- Be self-motivated to keep her/him abreast of the latest technological developments
- Regularly attend skills workshops

Learner Resources:

- Text/ resource book
- Protective clothing

2.4.3 Infrastructure, equipment and finances

Schools must ensure that teachers have the necessary infra-structure, equipment and financial resources for quality teaching and learning.

Infrastructure

- Plumbing cannot be implemented in a school without an equipped workshop with suitable desks, chairs and workbenches.
- Electricity supply to the workshop is crucial.
- Lighting and ventilation is of extreme importance and a workshop should ideally have multiple exits with doors that open outward.
- Tools and equipment should have sufficient storage and well developed storage management system with an up to date inventory. Shelves should be clearly marked and storage areas defined.
- Good housekeeping principles require that all workshops be cleaned regularly. A suitable waste removal system should be in place to accommodate refuse, off-cut materials as well as chemical waste. The requirements of the Occupational Health and Safety (OHS) Act 85 of 1993 need to be complied with at all times.

- Machinery on stands should be permanently affixed to the floor, with isolation switches for the mains supply. All machines should have working machine guards.
- The workshop must have a lockable mains distribution board. The workshop must be fitted with an emergency cut off switch/s which is/are easily accessible at all times. The red, mushroom type, emergency switch should preferably be lockable to prevent accidental re-connection with mains in the case of it being activated.
- Safety rules must be displayed on posters in the workshop.

NOTE:

- Register the schools with the Institute of plumbers South Africa (IOPSA).
- Registration of the teacher and learners in their last year with IOPSA will allow learner to attend meetings once a month at IOPSA venues. This will give the learner access to new products, laws and problems encountered in the industry.

Equipment

The following is the minimum requirement for a Plumbing workshop.

Non Consumable		Consumables	
Hand Tools	Electrical Tools	Materials	
<ul style="list-style-type: none"> • Shifting Spanners • Stilton wrench • Under basin spanners • Element spanner • 800gm and 1,8Kg club hammer • Ball peen hammer • Copper pipe cutter • Plastic pipe cutter • Tap reseater • Gas Gun • Hack saw • Spirit level 	<ul style="list-style-type: none"> • Hammer • action drill • Angle grinder • Soldering iron 	<ul style="list-style-type: none"> • Flux, • Solder • Hemp • Tread • Tape • PVC Glue • Stag. 	<ul style="list-style-type: none"> • Pipes and fittings • Sanitary fittings and units • Valves • Geysers • Flat plate solar panels • UV tubes • Cisterns • Galvanized plates • Display boards • Heat pump • SANS book • SA Plumber handbook 2013 compiled by

Non Consumable		Consumables	
Hand Tools	Electrical Tools	Materials	
<ul style="list-style-type: none"> • Pliers • Vice Grip • Tape Measure • Tin snips • Screw driver set • Masonry chisel • Water Pump pliers 			Mervyn Jordan

Finances:

Budget and inventory

A budget must be allocated for the subject. The amount will be determined by the number of learners taking the subject across all the years and the nature of the practical work required as stipulated in the curriculum. The budget needs to be revised annually and must consider all resources needed per year. The funding must make provision for maintenance of equipment and the replacement over the years.

Resourcing could be sub divided into the following categories:

- ☐ Safety Equipment
- ☐ Tools and Equipment
- ☐ Consumable Materials
- ☐ Practical Assessment Task Resources (PAT)
- ☐ Teaching and Learning Support Material
- ☐ Maintenance

A stock inventory must be maintained by the teacher and verified annually by a Senior Management Team member.

2.5 Career opportunities

Career and occupational opportunities for learners with a foundation in Plumbing include but is not limited to:

- Plumbing apprentice
 - To assist a qualified plumber until such time as he feels competent to and prepared for the trade test.
- Marketing
 - Sell plumbing supplies
- Entrepreneurship
 - Do small repairs

SECTION 3:

OVERVIEW OF TOPICS PER TERM AND ANNUAL TEACHING PLANS

3.1 Content Overview

TOPIC	Year 1	Year 2	Year 3	Year 4
1. Safety	Personal workshop safety	Personal safety Workshop safety and Good housekeeping	Personal safety Tool & power tool safety; Practical Ladder safety	Personal Tool & power tool safety ; Practical ladder safety
2. Water cycle.	The movement of water from source to dams	The movement of water from source to rivers, dams and the sea	Revision of year 1 & 2	Revision of year 1 & Describe the continuous movement of water in the water cycle Describe the four processes for the cycle to take place
3. Water Supply	The movement of water from the dams to domestic and industry for daily use	Hot & cold water supply Hard & soft water	Introduction of hot and cold water supplies	Practical of basic installation
4. Tools & equipment	Basic hand tools	Basic hand tools Specialized hand tools Introduction to power tools	Handling of hand & power tools	Practical usage of all tools
5. Materials	Pipes & fittings	PVC piping Pex (multi-layer) pipe Copper pipes Galvanized pipes	PVC piping Pex (multi-layer) pipe Copper pipes Galvanized pipes	Adhesives pipes & fittings

TOPIC	Year 1	Year 2	Year 3	Year 4
		Plastic fittings Galvanized fittings Brass fittings copper fittings	Plastic fittings Galvanized fittings Brass fittings Copper fittings	
6. Fittings	Copper and brass	Galvanized, PVC, copper & brass fittings	Practical application of the fittings	Practical application of the fittings
7. Geyser		Explain function of a geyser, sketch	Install a geyser according to SANS 10254	Install a geyser according to SANS 10254
8. Valves	T&P Valves (temperature and pressure) control valves, vacuum breakers, stop cocks, bolo stop	T&P Valves (temperature and pressure) control valves, vacuum breakers, stop cocks, bolo stop	Practical application of valves. Metering taps, demand taps electronic taps	Practical application and repairs of valves
9. Connecting pipes	Copper, pex, galvanized	Solvent weld PVC pipe Copper, pex, galvanized	Practical application of pipes	Practical application & inspection of pipes
10. Freehand drawing	Draw a geyser	Scaled drawings of geyser	Interpretation of plumbing drawings and basic symbols in plumbing	Application of basic drawings in plumbing
11. SANS	SANS (SOUTH African National Standards)	Hot & cold water supply, valves.	SANS 10254 SANS 10252 (1) SANS10252 (2) SANS 10400 SANS 10106 SANS 1352	SANS 10254 SANS 10252 (1) SANS10252 (2) SANS 10400 SANS 10106 SANS 1352
12. Calculations	Only in year 3 &4	Only in year 3 &4	Pipe calculations, pipe measuring, pipe sizing	Pipe calculations, pipe measuring, pipe sizing

TOPIC	Year 1	Year 2	Year 3	Year 4
13. Measuring	Measuring of a small galvanized project e.g. scoop Basic pipe measuring copper galvanized	How to measure between two fittings. (copper, PVC, galvanized, brass)	Measuring and laying out a drainage system. Measuring how much material is required for a plumbing installation	Revision of year 1, 2, 3. Measuring and laying out a drain-age system. Measuring how much material is required for a plumbing installation
14. Solar water	Only year 3 & 4	Only year 3 & 4	Introduction of solar systems Installation of solar water systems	Installation of solar systems. Repair and maintenance of solar water systems
15. Heat pumps	Only in year 3 & 4	Only in year 3 & 4	Introduction of heat pumps Installation of heat pumps	Installation of heat pumps Repair and maintenance of heat pumps
16. Soldering	Soldering of galvanized sheets	Soldering of copper to copper, brass to copper, copper brass to galvanize	Soldering of copper to copper, brass to copper, copper brass to galvanize	Soldering of copper to copper, brass to copper, copper brass to galvanize
17. Flushing systems	Basic cistern how it operates	Side entry, bottom entry. Striping and checking for faults	Concealed cisterns, flush masters, electronic flushing systems	Revision of year 1, 2, 3. Concealed cisterns, flush masters, electronic flushing systems
18. Installations of Sanitary units	Water supply to units	Installation of units and showers	Repair of Units	Repair of Units
19. Sewerage	Only in year 2, 3, 4	110mm pipe 50mm	Galleys, vents	Septic tanks

TOPIC	Year 1	Year 2	Year 3	Year 4
		pipe fittings; Bends, Junctions, couplers	Saddles, Grey & black water	grease traps laying drains, Toilets, basins, baths, showers
20. Planning and preparation of plumbing works	Year 3&4	Year 3&4	Planning of the installation of hot and cold water reticulation	Planning of the installation of hot and cold water reticulation. Pipe sizing, water flow
21. Galvanized sheet metal work	Small projects small scoop	Making a small box	Bending and fitting gutters. Making left and right bends	Revision of year 1, 2,3 manufacturing of chimney flashing
22. Maintenance & Repairs of Gutters & Downpipes	In year 3&4	In year 3&4	Working out the fall of gutters, how to make 90-degree bends left and right	Working out the fall of gutters, how to make 90-degree bends left and right fitting down pipes
23. Maintenance and repairs	Only in year 3&4	Only in year 3&4	Water supply, hot & cold water systems, sewerage, solar water systems, heat pumps. Flushing systems	Water supply, hot & cold water systems, sewerage, solar water systems, heat pumps. Flushing systems
24. Invoices, quotations	In years 2,3&4	Basic pricing and invoices	Writing out quotations and invoices	Writing out of quotations and invoices
25: Regulatory bodies	SANS JASWIC IOPSA PIRB	SANS JASWIC IOPSA PIRB	SANS JASWIC IOPSA PIRB	SANS JASWIC IOPSA PIRB

TOPIC	Year 1	Year 2	Year 3	Year 4
	NRCS OHS Safety act	NRCS OHS Safety act	NRCS OHS Safety act	NRCS OHS Safety act

PUBLIC COMMENT

3.2 Content Outline per Term

Year 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1,2,3	Safety	<ul style="list-style-type: none"> Identify dangers in the workshop. 	<ul style="list-style-type: none"> Check if protective clothing is worn in the workshop
	The water supply. Regulatory body's old water supply	<ul style="list-style-type: none"> Identify and list water borne diseases caused by poor plumbing: Diarrhoeal, Cholera, Bacillary Dysentery, Typhoid, Legionaries Describe how water arrives at the tap Describe the functions SABS, JASWICIOPSA, PIRB, OHS Occupational Health and Safety Consumer protection act Describe SANS10254 (South African National Standards) The installation, maintenance, repair and replacement of fixed electric storage water heating systems. Geysers Explain SANS 10252-1 (water supply installations for buildings) Explain SANS 10252-2 (Drainage installation for buildings) 	<ul style="list-style-type: none"> Explain about water borne diseases: diarrhoeal, cholera, bacillary dysentery, typhoid & legionaries Pictures, Videos DVDs' A visit to the local purification plant. Pointing and showing pressure tanks and reservoirs. And their functions Short TEST about work covered

			<p>water, efficient delivery of water services and safety of water installations</p> <ul style="list-style-type: none"> • IOPSA is a permanently appointed member of the SABS and JASWIC technical committees, they are involved in training plumbers inspecting work done by plumbers and keeping a good standard of work quality • PIRB was started by IOPSA to proactively promote plumbing practices that protect the health and safety of the community. And the registration system of plumbers so monitoring their performance • OHS Occupational Health and safety • Consumer protection act: to protect the customers from incorrect work done, and inferior products • Cut away of geyser demonstration by teacher • Explain the principle of hot water (water rises when heated accumulating on the top part of the geyser because molecules are lighter until the whole vessel is full of hot water) • Demonstrate Stratification (the splitting up of layers in a vessel top hot bottom cold). Draw on board, and demonstrate practically • Explain briefly SANS 10254, 10252-1, 10252-2 reference manual: Plumbers Hand book • Explain briefly solar hot water heaters & heat pump
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			<p>Visual teacher show and explains how it work, each child is asked to explain</p> <ul style="list-style-type: none"> • Test about weeks' work, summarize previous week work shortly • Video on geyser explosion and photos discussion on what was seen
4	<p>Introduction of basic tools for small repairs</p> <p>Safety of tools beginning</p>	<ul style="list-style-type: none"> • Use tools correctly: <ul style="list-style-type: none"> ○ Shifting spanner (used for loosening nuts fittings) ○ water pump pliers, (used for loosening pipe) ○ Bastard file unsafe with no handle, chisel unsafe if head is flared, hammer with loose head. Broken or damaged tools unsafe 	<ul style="list-style-type: none"> • Photos, visual and describe its operation • Handling the tools, learners handle tools • Correct use of the tool. Demonstration by teacher on correct usage of tools • Dangers of incorrect handling. Photos and demonstration • Short test visual • Teacher asks for a tool and learner finds it • Test on previous three weeks' work
	Test. tool identification	<ul style="list-style-type: none"> • Identify water treatment, hot water supply, tools and safety • Explain SANS 	<ul style="list-style-type: none"> • Repeat all of above again. Tests
	Workshop safety	<ul style="list-style-type: none"> • Identify dangers in the workplace • Wear protective clothing (overalls, gloves, safety shoes, goggles etc.) • Identify tool safety • Identify ladder safety 	<ul style="list-style-type: none"> • Photos • Slide show • Practical application of ladder safety, applying 11 rules of ladder safety

		<ul style="list-style-type: none"> Learn 11 safety rules of the ladder 	
5,6	Materials Fittings Pipes	<ul style="list-style-type: none"> Identify Pipes: <ul style="list-style-type: none"> copper multilayer plastic galvanized Identify Fittings: <ul style="list-style-type: none"> brass galvanized plastic copper Work with Galvanized sheets Identify consumable materials: <ul style="list-style-type: none"> flux solder thread tape hemp solvent weld glue sag 	<ul style="list-style-type: none"> Photos showing pipes, fittings, consumables Operation and use of the above Practically feeling, touching, and working with pipes & fittings Cutting strips of galvanized sheets
7, 8	Introduction to measuring Measuring and making a small	<ul style="list-style-type: none"> Understand how to work with a: <ul style="list-style-type: none"> tape measure steel rule straight edge scribe 	<ul style="list-style-type: none"> Photos Practical use of a tape steel rule straight edge, scribe & divider Measuring different objects Applying practically and measuring a scoop

	scoop.	<ul style="list-style-type: none">○ divider• Measure and make a scoop	<ul style="list-style-type: none">• Cutting & making a small scoop• Test on terms work. Practical, theoretical
9, 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	
<p>Practical:</p> <p>Activity 1 Demonstration 25%</p> <ul style="list-style-type: none">• Demonstrate simple process skill/s e.g. Illustrate / show how water flows through a geyser. <p>Activity 2 Practical 50%</p> <ul style="list-style-type: none">• e.g. measuring of pipes and small objects, making a small scoop <p>Theory:</p> <p>Activity 3 Respond to questions 25%</p> <p>Pen and paper test (Oral or written)</p>			

Year 2 Term 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1,2,3	Safety Workshop safety The water cycle. Water recycling The water supply.	<ul style="list-style-type: none"> Identify dangers in the workshop Identify Dangers in the workplace, Wear protective clothing Identify Tool safety Identify Ladder safety Learn 11 safety rules of the ladder Describe the water cycle and how its purified Describe water recycling processes and Identify diseases caused by poor management of water: Describe the water supply chain 	<ul style="list-style-type: none"> Is protective clothing worn in the workshop? Explain about water borne diseases: diarrhoeal, cholera, bacillary dysentery, typhoid & legionaries. Photos Slide show Practical application of ladder safety, applying 7 rules of ladder safety Pictures Videos DVDs' A visit to the local purification plant. Pointing and showing pressure tanks and reservoirs. And their functions Short TEST about work covered
	Regulatory body's Hot and Cold water supply geysers.	<ul style="list-style-type: none"> Describe the functions SABS, JASWIC, IOPSA, PIRB, OHS Occupational Health and Safety, Consumer protection act Describe SANS10254 (South African National Standards) 	<ul style="list-style-type: none"> Brief description of each regulatory body and their functions in the plumbing industry SABS tests products for safety, quality, redress JASWIC setting and maintaining of national standards

		<ul style="list-style-type: none"> • Install, maintain repair and replace fix electric storage water heating systems. Geysers <p>SANS 10252-1 (water supply installations for buildings)</p> <ul style="list-style-type: none"> • Explain SANS 10252-2 (Drainage installation for buildings) 	<p>for water supply and sanitation, promoting the prevention of water wastage, efficient services use of water, efficient delivery of water services and safety of water installations</p> <ul style="list-style-type: none"> • IOPSA is a permanently appointed member of the SABS and JASWIC technical committees, they are involved in training plumbers inspecting work done by plumbers and keeping a good standard of work quality. • PIRB was started by IOPSA to proactively promote plumbing practices that protect the health and safety of the community. And the registration system of plumbers so monitoring their performance • OHS occupational Health and Safety • Consumer protection act: to protect the customers from incorrect work done, and inferior products. • Cut away of geyser demonstration by teacher • Explain the principals of hot water (water rises when heated accumulating on the top part of the geyser because molecules are lighter until the whole vessel is full of hot water) • Demonstrate Stratification (the splitting up of layers in a vessel top hot bottom cold). Draw on board, and demonstrate practically. • Explain briefly SANS 10254, 10252-1, 10252-2
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			<p>reference manual: Plumbers Hand book</p> <ul style="list-style-type: none"> • Explain briefly solar hot water heaters & heat pump. Visual teacher shows and explains how it works; each child is asked to explain. • Test about weeks' work, summarize previous week work shortly. • Video on geyser and discussion on what was seen.
4	Tools & Equipment	<ul style="list-style-type: none"> • Identify, use and care for tool correctly: <ul style="list-style-type: none"> ○ Shifting spanner (used for loosening nuts fittings) ○ water pump pliers, (used for loosening pipe) ○ Bastard file unsafe with no handle, chisel unsafe if head is flared, hammer with loose head. Broken or damaged tools unsafe. 	<ul style="list-style-type: none"> • Photos, visual and describe its operation. • Handling the tools, learners handle tools. • Correct use of the tool. Demonstration by teacher on correct usage of tools • Dangers of incorrect handling. Photos and demonstration. • Short test visual • Teacher asks for a tool and learner finds it. • Test on previous three weeks' work.
		<ul style="list-style-type: none"> • Identify Water treatment, hot water supply, tools, safety, explaining SANS, 	<ul style="list-style-type: none"> • Repeat all of above again. Tests
5,6	Materials	<ul style="list-style-type: none"> • Identify different types of pipes: • Identify the different types of fittings: • Work with Galvanized sheets. 	<ul style="list-style-type: none"> • Photos showing pipes, fittings, consumables. • Operation and use of the above. • Practically feeling, touching, and working with

		<ul style="list-style-type: none"> Identify consumable materials: 	<p>pipes & fittings.</p> <ul style="list-style-type: none"> Cutting strips of galvanized sheets
7,8	Measuring	<ul style="list-style-type: none"> Understand how to work with measuring tools Measure and make a scoop. 	<ul style="list-style-type: none"> Photos, Practical use of a tape steel rule straight edge, scribe & divider. Measuring different objects Applying practically and measuring a scoop Cutting & making a small scoop Test on terms work. Practical, theoretical.
9, 10	Formal Assessment	<p>The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.</p>	

Practical:

Activity 1 Demonstration 25%

- Demonstrate simple process skill/s e.g. Illustrate / show how water flows through a geyser.

Activity 2 Practical 50%

- e.g. measuring of pipes and small objects, making a small scoop

Theory:

Activity 3 Respond to questions 25%

Pen and paper test (Oral or written)

Year 2 Term2

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1,2	Safety Fittings	<ul style="list-style-type: none"> Revise the following concepts of safety in the workshop: <ul style="list-style-type: none"> <u>The 10 safety rules of the workplace</u> 	<ul style="list-style-type: none"> Climbing ladder and checking if safety rules are applied. Slide show on ladder safety. Videos pictures Checking if personal safety if applied (overalls, gloves, safety shoes, goggles, etc.) New work: 10 safety rules of workplace Practical application SANS 10254 (drawing of geyser with all parts) Explaining geyser function Fitting game, to check knowledge of fitting names (requirement one box of mixed fittings copper, brass, galvanized, plastic, some geyser parts. Learners sit around a table fitting are emptied out on the table and spread out. Teacher asks for a fitting first learner to touch and pick up the right fitting keeps it, if fitting is incorrect a fitting is put back. This is done till no more fitting are in the middle, the winner is the one with the most fittings.)

			<ul style="list-style-type: none"> • Make a small container from galvanized plate. • Measure with tape, steel rule, scribe, dividers. • Laying out tools and identifying (teacher asks each learner to identify a tool and marks are allocated per correct tool identified while learners watch and learn making sure you ask the weaker learners last) geyser parts can be included.
3,4	Planning and preparation of plumbing works	<ul style="list-style-type: none"> • Inspect plumbing installations • Fault find • Identify new plumbing products • Identify the dangers caused by incorrect installation 	<ul style="list-style-type: none"> • Inspection of plumbing systems on school premises • Visit a plumbing store • Inspect a buildings plumbing • Identify fault, dangers and health hazards • Learner writes about visit. • N.B. EVERY HIGHLIGHT THE LEARNER MUST WRITE ABOUT IT, TO IDENTIFY WHAT HE OR SHE HAS UNDERSTOOD.
5	Soldering	<ul style="list-style-type: none"> • Practice safety precautions when soldering 	<ul style="list-style-type: none"> • Videos on safety • Pictures of safety on soldering

	<p>Soldering</p> <p>Measuring</p>	<ul style="list-style-type: none"> Learn how to solder two copper pipe to copper & brass fittings using flux and plumbers solder Learn how to measure pipes between two fitting (copper or brass) 	<ul style="list-style-type: none"> Videos on safety Pictures of safety on soldering How to solder step by step description copper or brass PRACTICAL: soldering brass & copper fittings. Demonstrating how a T&P valve works, how a vacuum breaker works Test practical: soldering, neatness, of work do correctly measured
6	Valves	<ul style="list-style-type: none"> Identify the different types of valves used in plumbing: <ul style="list-style-type: none"> Taps Gate valves T&P valves Control valves Vacuum breakers Banjo control valve One way valves 	<ul style="list-style-type: none"> Valves: vacuum breakers, pressure control, T&P valves, banjo valves, one-way valve valves
7,8	Valves	<ul style="list-style-type: none"> Explain and describe the function of the following valves <ul style="list-style-type: none"> Flush valves Air release valves Gate valves Stop cock Ball valves 	<ul style="list-style-type: none"> Flush valves: flush master junior & standard Full description of flush master's operation advantages and disadvantages of the above Describe how an air release valve works demonstrate and show valves operation

		<ul style="list-style-type: none">○ Demand valves○ Metering valves○ Float valves	<ul style="list-style-type: none">• Show gate valve and cutaway of valve and operation• Demand tap show operation of tap• Metering tap show operation and difference of demand and metering tap float valve show operation.• A BOARD OF VALVES SHOWING CROSS-SECTION AND VALVE NUMBERED THESE CAN BE USED FOR TESTS
9, 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	
<p>Practical:</p> <p>Activity 1 Demonstration 25%</p> <ul style="list-style-type: none">• Demonstrate simple process skill/s e.g. soldering <p>Activity 2 Practical 50%</p> <ul style="list-style-type: none">• E.g. Fit valves to a system <p>Theory:</p> <p>Activity 3 Respond to questions 25%</p> <p>Pen and paper test (Oral or written)</p>			

YEAR 2 TERM 3

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1,2,3	Safety Cisterns Domestic Hot water storage systems	<ul style="list-style-type: none"> Identify Electrical tooling safety content and technique Learn about the different types of Cisterns: <ul style="list-style-type: none"> close coupled, split systems, bottom entry, side entry Strip and assemble different kinds Learn about the different parts of the domestic HWC (geysers): <ul style="list-style-type: none"> anti-siphon loops, T&P valves, control valves, vacuum breakers drain cocks 	<ul style="list-style-type: none"> Inspection before using any electrical tool, check that the earth leakage operates correctly, use tools according to manufactures safety instructions Images of close coupled & split cisterns, demonstration of bottom entry and side entry. Cutaways of valves T&P, vacuum breakers, control valves & ball valves. Function of geyser thermostat, element & sacrificial anode.

4	Water supply installation of sanitary units	<ul style="list-style-type: none"> Identify <ul style="list-style-type: none"> Hard water soft water, grey water black water Level <ul style="list-style-type: none"> toilets, basin, baths pipes 	<ul style="list-style-type: none"> Hard water what: effects of hard water has on the plumbing indu Grey water is water from showers basin etc. Black water sewerage, industries water. How to level a toilet (video) How to level a basin(video) How to level a bath (video)
5,6,7	Installation of sanitary units	<ul style="list-style-type: none"> Make a cement mix for base, water closet (toilet) basin and shower Install a bath Install a shower 	<ul style="list-style-type: none"> Correct cement mix ratio cement sand & water for base. Building a bath in and laying brick correctly with inspection hole. From the plan drawing of the shower do an accurate installation.
8	Geyser SANS 10254	<ul style="list-style-type: none"> Check geyser installation according to installation regulations Check list of SANS 10254 	<ul style="list-style-type: none"> Checking if geyser installation is according to SANS10254 if not geyser is non-compliant. Either mistakes have to be repaired or client signs and takes responsibility for work done. Last person working on the installation is responsible for safety of geyser

	Valves	<ul style="list-style-type: none">• Install<ul style="list-style-type: none">○ Install water closet (WC toilet), basin and shower• Identify:<ul style="list-style-type: none">○ Control valves○ Vacuum breakers○ T&P valves○ Drain cock and Stop cocks○ Anti-siphon loops	<ul style="list-style-type: none">• Installing a toilet and levelling it• Installing a basin and levelling it• Identifying valves and function thereof (control valves T&P valves, vacuum breakers, stop cocks.)
9, 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	

Practical:

Activity 1 Demonstration

25%

- Demonstrate simple process skill/s e.g. strip and reassemble a cistern, make a concrete mix

Activity 2 Practical

50%

- e.g. Install water closet (WC toilet), basin and shower

Theory:

Activity 3 Respond to questions

Pen and paper test (Oral or written)

25%

YEAR 2 TERM 4

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1,2	Water supply Safety of tools Ladder safety Electrical tools	<ul style="list-style-type: none"> Revise <ul style="list-style-type: none"> Hot & cold water supply Safety of tools Electrical machinery Ladder safety 	<ul style="list-style-type: none"> Do a speed test on a geyser installation. Check all tool and electrical machinery write small report on all PRACTICAL: Check ladder, apply all 7 rules: inspect, secure ladder foot and at top, make sure angle is correct, make sure ladder protrusion is correct, check that three point are always used (one hand two feet, two hand one foot), one person one ladder.
3,4,5	Geysers SANS 10254	<ul style="list-style-type: none"> Learn the function of HWC (hot water cylinders) Apply SANS 10254 	<ul style="list-style-type: none"> Slide show on different types of HWC Explaining on the cutaway geyser function of valves elements, thermostats, insulation, anodes etc. Do a practical installation and record time take for each student? Installation, maintenance and repairs of the above.
6,7	Quotation	<ul style="list-style-type: none"> Calculate cost, expenses and pricing of a geyser installation. 	<ul style="list-style-type: none"> Invoice layout. Expenses (distance travelled consumables, time taken, recommended time. Learning how to shop for the right price.

8 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
Practical: <p>Activity 1 Practical 75%</p> <ul style="list-style-type: none"> e.g. Installation of hot water system (a geyser according to SANS 10254) Theory: <p>Activity 2 Respond to questions 25%</p> <p>Pen and paper test (Oral or written)</p>		

Year 3 Term 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1, 2,3,4	Safety	<ul style="list-style-type: none"> Revise year 2 <ul style="list-style-type: none"> Practical application of personal safety (correct safety dress: overalls, safety boots, safety goggles, safety gloves.) Practical application of identifying dangerous tools. 	<ul style="list-style-type: none"> Revision of year 2 Inspecting safety dress of learners and remarking on it. Placing all tools on a table and identifying the dangerous ones and commenting on the danger thereof.
5	Ladder	<ul style="list-style-type: none"> Practice safety Check that all safety precautions are taken before climbing a ladder 	<ul style="list-style-type: none"> Ladder Inspecting the angle, the runs, the condition, that the ladder is in, secured at the bottom and the top, that the top of the ladder protrudes 3 runs over the roof.
6	Electrical equipment	<ul style="list-style-type: none"> Practice safety Identify unsafe electrical equipment. 	<ul style="list-style-type: none"> Inspecting electrical equipment and commenting on dangers
7	Water supply	<ul style="list-style-type: none"> Find different ways which to obtain hot and cold water 	<ul style="list-style-type: none"> Discussing geysers, solar water heaters, heat pumps. Inspecting electrical equipment and commenting on dangers

8	<p>Tools & equipment</p> <ul style="list-style-type: none">• Material use in plumbing.• Plumbing fittings• Plumbing valves.	<ul style="list-style-type: none">• Handle plumbing tools & electrical tools.• Identify:<ul style="list-style-type: none">○ plumbing material used in plumbing○ different fittings used in plumbing• Identify and know the functions of different valves	<ul style="list-style-type: none">• Practical handling of hand tools and power tools.• Identifying PVC piping, copper pipes, galvanized pipes, copper, brass, copper & galvanized fittings, plastic fittings and galvanized plate.• Identification of valves, metering tap, demand taps, electronic taps, gate valves, control & relief valves, T & P valves, vacuum breakers and one way valves.
9, 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	

Practical:

Activity 1 Demonstration

25%

- e.g. Demonstrate simple safety process skill/s

Activity 2 Practical

50%

- e.g. Install a basin

Theory:

Activity 3 Respond to questions

25%

Pen and paper test (Oral or written)

YEAR 3 TERM 2

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1,2	Interpretation of plumbing drawings and symbols. FREEHAND DRAWINGS	<ul style="list-style-type: none"> Learn how to read building drawing plans. And plumbing symbols 	<ul style="list-style-type: none"> Building Drawing plans SANS 104000 (building regulations)
3,4	SANS 10254 geysers	<ul style="list-style-type: none"> Install, maintain, repair HWC (hot water cylinders) Interpret SANS 10254 	<ul style="list-style-type: none"> Practical installation of geysers, control valves, T&P valves, anti-siphon loops and vacuum breakers. Correct distances of vacuum breakers from geysers. Correct construction of anti-siphon loop.
5,6	Solar systems	<ul style="list-style-type: none"> Examine solar installation: Angle direction of panel. Checking roof trusses and shadow rotation between winter and summer. Identify different type of panels and types 	<ul style="list-style-type: none"> Solar panel: Placing panel facing the right direction Placing the panel at the correct angle Checking the roof trusses and strengthen them with supports

			<ul style="list-style-type: none"> Types of panels: flat panel, evacuator tubes. Two main systems: Direct for temperatures above 0 Celsius. Water warms us the geyser. Indirect for temperatures below 0 Celsius glycol (antifreeze) warms up the water. And 5 different systems: Close coupled Direct Pumped Split Thermo siphon
7	Application of piping	<ul style="list-style-type: none"> Learn to solder: <ul style="list-style-type: none"> copper piping Copper and brass fittings. 	<ul style="list-style-type: none"> Practical learning to solder copper piping, copper to brass
8	Flushing systems	<ul style="list-style-type: none"> Discuss the operation of: <ul style="list-style-type: none"> Concealed cisterns Side entry Bottom entry Dual cisterns Flush master Electronic systems 	<ul style="list-style-type: none"> Illustrate operation of a concealed cistern

9, 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
<p>Practical:</p> <p>Activity 1 Demonstration 25%</p> <ul style="list-style-type: none"> • Demonstrate simple process skill/s e.g. Demonstrate layout of a solar system or interpret site plans <p>Activity 2 Practical 50%</p> <ul style="list-style-type: none"> • E.g. Assemble/ install a flushing system <p>Theory:</p> <p>Activity 3 Respond to questions 25%</p> <p>Pen and paper test (Oral or written)</p>		

Year 3 Term 3

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1, 2, 3,	Solar water systems	<ul style="list-style-type: none"> • Install, maintain and repair solar water systems • Discuss SANS 10106 	<ul style="list-style-type: none"> • Solar panel: Placing panel facing the right direction • Placing the panel, the correct angle • Checking the roof trusses and strengthen them with supports • Types of panels: flat panel, evacuator tubes. • Two main systems: Direct for temperatures above 0. Water warms us the geyser. Indirect for temperatures below 0 glycol (Antifreeze) warms up the water. And 5 different systems: Close coupled Direct; Pumped; Split, Thermo siphon
4, 5,6	SANS 1352 Heat pumps	<ul style="list-style-type: none"> • Install, maintain and repair heat pumps • Apply of SANS 1352 	<ul style="list-style-type: none"> • Explaining how a heat pump works. • Drawing the heat pump cycle • Naming all the components' <ul style="list-style-type: none"> • Demonstrating how the diverter valve works

7,8	Planning & invoices	<ul style="list-style-type: none">• Write an invoice• Plan plumbing work	<ul style="list-style-type: none">• Working out costs of material, labour costs and expenses• Planning work to be done taking the right tools & material to the work area.
9, 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	

Practical:

Activity 1 Demonstration

25%

- Demonstrate simple process skill/s e.g. identify components of solar panel and heat pump

Activity 2 Practical

50%

- E.g. Install a Solar panel and a heat pump.

Theory:

Activity 3 Respond to questions

25%

Pen and paper test (Oral or written)

Year 3 Term 4

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1,2	Galvanized sheet metal work	<ul style="list-style-type: none"> Install gutters and downpipes 	<ul style="list-style-type: none"> Making 90 degree inside and outside corners fitting shoes to gutters. Working out angles on downpipes.
3, 4	Quotations	<ul style="list-style-type: none"> Write an invoice for a geyser installation Write a quotation and an invoice on: <ul style="list-style-type: none"> A small job (repair a tap or fix a pipe replacing a valve) A geyser, solar or heat pump installation 	<ul style="list-style-type: none"> Working out costs of material, labour costs and expenses of a geyser installation Revise on old invoices, supply part lists with prices. Explain labour cost, and mark up of parts. Explain consumables and extra expenses.
5,6	Valves Flushing systems	<ul style="list-style-type: none"> Explain why T&P, control valves, vacuum beaker, stop cocks, drain cocks, are used in geysers solar and heat pumps. Explain the repair of a leaking stop cock naming parts. And what would cause a water hammer. 	<ul style="list-style-type: none"> Geyser drawings, slides visual and practical explanation of geyser operation and all valves with anti-siphon loop. Drawing naming all parts. Practically stripping tap and explaining how to repair it.

7	Water cycle Calculations	<ul style="list-style-type: none">• Explain ph. of water, hard and soft water.• Explain how to measure water pressure, and how height affect pressure• Explain how to measure water flow	<ul style="list-style-type: none">• Draw the PH scale• Show pipes that have calcium attached inside the pipe. Demonstrate with soap the difference of hard and soft water. Show how calcium accumulates in geysers and explain why• Show diagrams of water pressure and water flow.• Practically explain with a pressure gauge and a bucket or container that has being marked litres.
8 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	

Practical:

Activity 1 Practical

75%

- Install guttering and downpipes

Theory:

Activity 2 Respond to questions

25%

- Pen and paper test (Oral or written)

Year 4 Term1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Safety	<ul style="list-style-type: none"> Prevent accidents in the workplace Use the right tool & equipment and use them the right way Assess the risks before approaching the work Practice good housekeeping Wear protective clothing 	<ul style="list-style-type: none"> Signboards displaying dangers in workplace and appropriate protective clothing. Make aware of dangers in workplace Teach good housekeeping (clean work areas, tools packed away, on items laying around on the floor where people walk)
2	Tools & Equipment	<ul style="list-style-type: none"> Identify, use and care of all hand tools 	<ul style="list-style-type: none"> Lay out all tools and learner must identify them Demonstrate use of tools Watch how learner works with tools and correct if necessary Check how learner operates hand tools and correct if necessary
3	The water cycle	<ul style="list-style-type: none"> Describe continuous movement of water in the water Cycle Describe the four processes for the cycle to take place 	<ul style="list-style-type: none"> Drawings of the water cycle Boil water to show evaporation Cover a plant with plastic to show transpiration

			<ul style="list-style-type: none"> • Use a piece of plastic above some grass to show condensation • Use a kettle on a glass to show precipitation and condensation
4,5,6	Water supply	<ul style="list-style-type: none"> • Install a geyser according to SANS 10254 • Install a simple solar panel • Install a heat pump • Explain how a geyser functions • Explain how a solar panel functions • Explain how a heat pump functions • Draw a diagram explaining ph. of water • Explain Hard and soft water and how it affects the industry. 	<ul style="list-style-type: none"> • Practical application of SANS 10254 installation of a geyser. • Practical application of SANS10106 installation of a solar panel • Show drawings slides and practical application of geyser solar & heat pumps • Sketches demonstrating ph of water • Show pipes that have calcium attached inside the pipe. Demonstrate with soap the difference of hard and soft water. Show how calcium accumulates in geysers and explain why.
7	Fittings Valves Soldering Connecting of pipes	<ul style="list-style-type: none"> • Explain the operation of a <ul style="list-style-type: none"> ○ T&P valve ○ Control valve ○ Vacuum breaker ○ Drain cock 	<ul style="list-style-type: none"> • Show drawing of <ul style="list-style-type: none"> ○ T&P valve ○ Control valve ○ Vacuum breaker ○ Drain cock

		<ul style="list-style-type: none"> ○ Anti-siphon loop ○ Stop cock • Solder a pipe • Connect pipes with brass and plastic fittings 	<ul style="list-style-type: none"> ○ Anti-siphon loop ○ Stop cock • Explain the operation of the above • Show physically how to strip and assemble while explaining the operation of each one and what could happen if they were not there. • Video of geyser explosion
8	Calculations and Measurement	<ul style="list-style-type: none"> • Measure and cut a pipe accurately • Work out litres per minute • Work out Kpa (water pressure) reference to height • Measure pipe diameter 	<ul style="list-style-type: none"> • Slides of how to measure and cut a pipe • Video & slides of how to work out litres per minute • Practically measure pipe inside and outside diameter

9, 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
<p>Practical:</p> <p>Activity 1 Demonstration 25%</p> <ul style="list-style-type: none"> • Demonstrate simple process skill/s • e.g. Calculation – Measure cut pipes, and solder together <p>Activity 2 Practical 50%</p> <ul style="list-style-type: none"> • e.g. install geyser, solar and heat pump <p>Theory:</p> <p>Activity 3 Respond to questions 25%</p> <p>Pen and paper test (Oral or written)</p>		

Year 4Term2

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Safety Geyser Solar water heaters Heat pumps	<ul style="list-style-type: none"> • Apply safety rules • Draw and explain <ul style="list-style-type: none"> ○ geyser ○ solar water heater ○ heat pumps 	<ul style="list-style-type: none"> • Explain safety rules • Draw a geyser, solar hot water heater and heat pump installation. • Explain the functions of the above • Show slides of the above • Show real life installation
2	SANS	<ul style="list-style-type: none"> • Identify SANS for all <ul style="list-style-type: none"> ○ above ground, ○ below ground, ○ geyser, ○ building regulation, ○ solar hot water systems, heat pumps 	<ul style="list-style-type: none"> • Use SANS manual explains correct use of book.
3,4	Flushing systems	<ul style="list-style-type: none"> • Install a cistern and repair a <ul style="list-style-type: none"> ○ Close coupled 	<ul style="list-style-type: none"> • Notes, drawings, slides and practical installation of cisterns

		<ul style="list-style-type: none"> ○ Split ○ Concealed ○ Side entry ○ Bottom entry ○ Dual cistern 	<ul style="list-style-type: none"> • Practically show and strip and reassemble system parts and components. • Diagrams, drawings and videos
5,6	Sewerage	<ul style="list-style-type: none"> • Identify fittings used in sewerage piping • Understand the functions of: <ul style="list-style-type: none"> ○ Septic tanks ○ French drains ○ Grease traps 	<ul style="list-style-type: none"> • Display board of all fittings • Loose fittings and names • Explain and show different type of pipes used in sewerage installation • Drawings of septic tanks French drains & grease traps
7	Maintenance and repair of gutters & downpipes	<ul style="list-style-type: none"> • Maintain repair & replace gutters and downpipes 	<ul style="list-style-type: none"> • Drawings explaining gutters system • Display boards • Videos • Practical cutting soldering and making bends for gutters • Openings for shoes and connecting downpipes
8	Quotations	<ul style="list-style-type: none"> • Quote prices on labour and materials 	<ul style="list-style-type: none"> • Explain % mark up

		<ul style="list-style-type: none"> • Write invoices for labour and materials 	<ul style="list-style-type: none"> • Show old invoices • Explain labour and travel cost • Explain wear and tear of tools and equipment
	Regulatory bodies	<ul style="list-style-type: none"> • Explain the functions of regulatory bodies: <ul style="list-style-type: none"> ◦ SABS, JASWIC, IOPSA, PIRB, OHS safety act. 	<ul style="list-style-type: none"> • SANS South African national standards • IOPSA Institute of plumbing South Africa • PIRB Plumbing Industry Registration Board • JASWIC Joint Acceptance Scheme for Water Services Installation Components • OHS Occupational health and safety
9, 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	

Practical:

Activity 1 Demonstration 25%

- E.g. Demonstrate How a septic tank and French drain work., How a Solar water heater works, How a heat pump works

Activity 2 Practical 50%

- e.g. Install and repair a cistern, make a 90-degree bend for a gutter, Identify sewerage fitting

Theory:

Activity 3 Respond to questions 25%

Pen and paper test (Oral or written)

Year 4 Term 3

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Quotations	<ul style="list-style-type: none"> Write a quotation and an invoice for work to be done 	<ul style="list-style-type: none"> Show old invoices for prices Teach about labour cost Teach about mark up on items bought
	Safety Tools Equipment	<ul style="list-style-type: none"> Show dangerous tools and equipment Identify tools for plumbing Identify fitting, pipes, valves 	<ul style="list-style-type: none"> Display all tools learner to identify dangerous tools & plumbing tools Lay out all fitting brass, copper, plastic, galvanized 50mm & 40mm plastic fitting 110mm sewerage fitting learner must identify Lay out all valves, pipes learner must identify
2	Soldering	<ul style="list-style-type: none"> Solder galvanized pipe and fittings 	<ul style="list-style-type: none"> Show how to solder correctly Slides on soldering Video on soldering
	Fitting	<ul style="list-style-type: none"> Identify all brass and copper fitting 	<ul style="list-style-type: none"> Display board with all copper and brass fittings Pictures and videos of fittings

3, 4	Valves	<ul style="list-style-type: none"> ○ Identify parts of a bib or pillar tap Crutch <ul style="list-style-type: none"> ○ Spindle ○ Gland nut ○ Gland ○ Body ○ head gear ○ Tap rubber seal ○ Jumper ○ Tap seat ○ Tap spout ○ Identify parts of the gate valve Wheel <ul style="list-style-type: none"> ○ Spindle ○ Packing gland nut ○ Packing ○ headgear ○ headgear body washer ○ body ○ gate 	<ul style="list-style-type: none"> • Drawing, pictures, cut cross sections, videos • Parts of tap: • Drawings of gate valves, cross sections, videos. • Parts of gate valves: • TAPS: • Ball valve parts:
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		<ul style="list-style-type: none"> ○ gate seat ○ body well ○ Identify different kinds of taps Bib <ul style="list-style-type: none"> ○ Screw down ○ Pillar ○ Under tile ○ Ceramic ○ Electronic ○ Mixers ○ Identify ball valve parts Seating washer <ul style="list-style-type: none"> ○ Piston ○ Pivot split pin ○ Piston lever ○ Body ○ Float arm ● Float or ball 	
5	Flushing systems	<ul style="list-style-type: none"> ● Identify parts of a cistern ● Identify parts of super flow valve 	<ul style="list-style-type: none"> ● Show inside of cistern and name all parts ● Pictures and video

		<ul style="list-style-type: none"> Identify size of cistern flush 	<ul style="list-style-type: none"> Show super flow valve strip name parts a reassemble Show how to set 6 or 9 lt Show different size cisterns
6,7	Geysers	<ul style="list-style-type: none"> Identify all colours for geyser pressures Green, red, brown, black, brown Identify all colours and kilowatts of geyser elements Green 600 Kpa, red 400 Kpa, brown 300 Kpa, black 200 Kpa, blue 100 Kpa Identify all things not to be done to a T & P valve 	<ul style="list-style-type: none"> Chart for geyser pressures Show where to be found on geyser plate Chart with element colour and kilowatt Show visual colours All don'ts of T & P valve <ul style="list-style-type: none"> Must be metal Same size as the T& P outlet Must face down No traps No interconnection with expansion relief valve Discharge outside Discharge where not a nuisance Discharge visible

			<ul style="list-style-type: none">○ Not where it can be blocked○ Every 4 meters size up and every bend 600mm shorten○ Use bends not elbows
8	Solar water systems	<ul style="list-style-type: none">• Name all components, systems of solar and operation of solar systems.• Name all components and working operation of heat pumps	<ul style="list-style-type: none">• Slides, drawings and visual explanation of solar and heat pumps
9, 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	

Practical:

Activity 1 Demonstration

25%

- Demonstrate simple process skill/s e.g. **Demonstrate how a geyser, solar and heat pump functions**

Activity 2 Practical

50%

- **E.g. do a heat pump installation and or solar system.**

Theory:

Activity 3 Respond to questions

25%

- Pen and paper test (Oral or written)

Year 4 Term 4

WEEK	TOPIC	CONTENT Revision and consolidation The learner is able to:	Techniques, activities, resources and process notes
1	Quotations	<ul style="list-style-type: none"> Write a quotation and an invoice on: <ul style="list-style-type: none"> A small job (repair a tap or fix a pipe replacing a valve) A geyser, solar or heat pump installation 	<ul style="list-style-type: none"> Revise on old invoices, supply part lists with prices. Explain labour cost, and mark up of parts. Explain consumables and extra expenses.
2	Flushing systems	<ul style="list-style-type: none"> Explain why T& P, control valves, vacuum beaker, stop cocks, drain cocks, are used in geysers solar and heat pumps. Explain the repair of a leaking stop cock naming parts. And what would cause a water hammer. 	<ul style="list-style-type: none"> Geyser drawings, slides visual and practical explanation of geyser operation and all valves with anti-siphon loop. Drawing naming all parts. Practically stripping tap and explaining how to repair it.
3	Water cycle	<ul style="list-style-type: none"> Explain ph. of water, hard and soft water. 	<ul style="list-style-type: none"> Sketches demonstrating ph. of water Show pipes that have calcium attached inside the pipe. Demonstrate with soap the difference of hard and soft water. Show how calcium accumulates in geysers and explain why

4	Calculations	<ul style="list-style-type: none"> • Explain how to measure water pressure with what, and how height affect pressure • Explain how to measure water flow 	<ul style="list-style-type: none"> • Show diagrams of water pressure and water flow. • Practically explain with a pressure gauge and a bucket or container that has being marked litres.
5-10	External examination	<p>External moderation of school assessment over terms 1, 2 and 3 = 50% of qualification</p> <p>Complete external Practical Assessment Task (PAT) = 25% of qualification</p> <p>Formal external assessment written test or oral = 25% of qualification</p>	

SECTION 4

ASSESSMENT

4.1 Introduction

This section on assessment *standardises* the recording and reporting processes for the Technical Occupational Curriculum and Assessment Policy Statement that is offered in schools that offer this learning programme. It also provides a policy framework for the management of school based assessment and school assessment records.

It is critically required of teachers to offer all measures of differentiated assessment as outlined in Chapter 9 of the National Protocol for Assessment. Especially learners in special schools who follow the Technical Occupational Curriculum over a period of four years have diverse learning styles and support needs. Since a learner or learners may be functioning on different levels, the assessment / recording / reporting system must make provision to reflect the level(s) of each learner. Each learner, regardless of his/her number of years in the school, must have access to the standard of assessment best suited to his/her needs. The learner's *abilities* determine what will be expected of him/her and the *pacing* of instruction must accommodate each individual learner within a framework of high expectations (See Chapter 9 of the National Protocol for Assessment).

Learners are also eligible for Accommodations and Concessions as outlined in the Standard Operating Procedures for the Assessment of Learners who Experience Barriers to Assessment from Grade R to 12 (2017).

All decisions related to differentiated assessment are made through completing the protocols as outlined in the Policy on Screening, Identification, Assessment and Support (2014) and recorded and tracked through the Individual Support Plans of learners.

4.2 Assessment Principles

4.2.1 Definition

Assessment is a continuous planned process of identifying, gathering and interpreting information about the performance of learners, using various forms of assessment. It involves four steps: generating and collecting evidence of achievement; evaluating this evidence; recording the findings and using this information to understand and thereby assist the learner's development in order to improve the process of learning and teaching. Assessment should be both informal (Assessment

for Learning) and formal (Assessment of Learning). In both cases regular feedback should be provided to learners to enhance the learning experience.

Assessment is a process that measures individual learners' attainment of knowledge (content and concepts) and skills by collecting, analysing and interpreting the data and information obtained from this process to:

- Enable the teacher to judge a learner's progress in a reliable way;
- Inform learners of their strengths, weaknesses and progress; and
- Assist teachers, parents and other stakeholders in making decisions about the learning process and the progress of learners.

Assessment should be mapped against the content, skills, intended aims and topics specified in the learning programme. In both informal and formal assessments, it is important to ensure that in the course of a school year:

- All of the topics and content are covered;
- The full range of skills is included; and
- A variety of different forms of assessment are used.

4.2.2 Informal Assessment or Daily Assessment

Assessment for learning has the purpose of continuously collecting information on a learner's achievement that can be used to improve their learning. Informal assessment is a daily monitoring of learners' progress. This is done through observations, discussions, practical demonstrations, learner-teacher conferences, informal classroom interactions, etc. Informal assessment may be as simple as stopping during the lesson to observe learners or to discuss with learners how learning is progressing. Informal assessment should be used to provide feedback to the learners and to inform planning for teaching, but need not be recorded. It should not be seen as separate from learning activities taking place in the classroom. Learners or teachers can assess their performance in the tasks. Self-assessment and peer assessment actively involves learners in assessment. This is important as it allows learners to learn from and reflect on their own performance. The results of the informal daily assessment tasks are not formally recorded unless the teacher wishes to do so. **The results of daily, informal assessment tasks are not taken into account for progression, promotion and certification purposes.**

Informal, on-going assessments should be used to scaffold the acquisition of knowledge and skills and should be the stepping stones leading up to the formal tasks in the Programmes of Assessment.

4.2.3 Formal Assessment

All assessment tasks that make up a formal programme of assessment for the year are regarded as Formal Assessment. Formal Assessment Tasks are marked and formally recorded by the teacher for progression and certification purposes. All Formal Assessment Tasks are subject to moderation for the purpose of quality assurance and to ensure that appropriate standards are maintained. Formal assessment tasks form part of a year-long formal Programme of Assessment.

a. Why use a Formal Assessment task?

“Formal Assessment Task (assessment of learning)” – is a systematic way of assessment used by teachers to determine how well learners are progressing in a level and in a particular subject.

b. What is a Formal Assessment Task?

It is a set of questions and or instructions that learners need to respond to. A task may consist of a range of activities. A formal task must be valid, fair and reliable and must cover sufficient knowledge and or skills to report on the learners' progress.

Teachers must ensure that assessment criteria are very clear to the learners before the assessment process commences. This involves explaining to the learners which knowledge and skills are being assessed and the required length of responses. Feedback should be provided to the learners after assessment and could take the form of whole-class discussion or teacher-learner interaction. Examples of formal assessments include projects, oral presentations, simulations, performances, tests, examinations, practical demonstrations, etc. The **forms of assessment** used should be appropriate to the age and the developmental level of the learners as well as the context of the subject or skills being assessed. The assessment tasks should be carefully designed to cover the topic, content and or skills of the subject. The design of these tasks should therefore ensure that a variety of skills are assessed.

Practical Assessment Tasks allow for learners to be assessed on a regular basis during the school year and also allow for the assessment of skills that cannot be assessed in a written format, e.g. test or examination.

Assessment in the General Certificate of Education: Technical Occupational (GCE: TO)

Assessment in the GCE: TO is underpinned by the objectives of the National Qualifications Framework (NQF). These objectives are to:

- Create an integrated national framework for learning achievements.
- Facilitate access to and progression within education, training and career paths.
- Enhance the quality of education and training.
- Redress unfair discrimination and past imbalances and thereby accelerate employment opportunities.
- Contribute to the holistic development of the learner by addressing:
 - Social adjustment and responsibility;
 - Moral accountability and ethical work orientation;
 - Economic participation; and
 - Nation-building.

The principles that drive these objectives are:

- **Integration**

To adopt a unified approach to education and training that will strengthen the human resources development capacity of the nation.

- **Relevance**

To be dynamic and responsive to national development needs.

- **Credibility**

To demonstrate national and international values and acquired competencies and skills so as to ensure the recognition of the qualification to be attained.

- **Coherence**

To work within a consistent framework of principles and certification.

- **Flexibility**

To allow for creativity and resourcefulness when achieving skills to cater for different learning styles and use a range of assessment methods, instruments and techniques.

- **Participation**

To enable stakeholders to participate in setting standards and co-ordinating the achievement of the qualification.

- **Access**

To address barriers to learning at each level to facilitate learners' progress.

- **Progression**

To ensure that the qualification framework permits individuals to move through the levels of the national qualification via different, appropriate combinations of the components of the delivery system.

- **Portability**

To enable learners to transfer parts of a qualification from one learning institution and/or employer to another institution or employer.

- **Articulation**

To allow for vertical and horizontal mobility in the education system when pre-requisites for accreditation have been successfully completed.

- **Recognition of Prior Learning**

To grant credits for a unit of learning following an assessment or if a learner possesses the capabilities specified in each skills area.

- **Validity of assessments**

To ensure assessment covers a broad range of knowledge, skills, values and attitudes (SKVAs) needed to demonstrate applied competency. This is achieved through:

- Clearly stating the skill to be assessed;
- Selecting the appropriate or suitable evidence;
- Matching the evidence with a compatible or appropriate method of assessment; and
- Selecting and constructing an instrument(s) of assessment.

- **Reliability**

To assure assessment practices are consistent so that the same result or judgment is arrived at if the assessment is replicated in the same context. This demands consistency in the interpretation of evidence; therefore, careful monitoring of assessment is vital.

- ***Fairness and transparency***

To verify that no assessment process or method(s) hinders or unfairly advantages any learner. The following could constitute unfairness in assessment:

- Inequality of opportunities, resources or teaching and learning approaches;
- Bias based on ethnicity, race, gender, age, disability or social class;
- Lack of clarity regarding topic, content or skill being assessed; and
- Comparison of learner's work with that of other learners, based on learning styles and language.

- ***Practicability and cost-effectiveness***

To integrate assessment practices within the teaching and learning process and strive for cost and time-effective assessment.

4.3 Managing Assessment

Assessor Requirements

Assessors must be subject specialists with adequate formal assessment experience. If the teacher conducting the assessments has not been declared a competent assessor, an assessor who has been declared competent may be appointed to oversee the assessment process to ensure the quality and integrity of assessments for the qualification.

Types of Assessment

Assessment benefits the learner and the teacher. It informs learners about their progress and helps teachers make informed decisions at different stages of the learning process. Depending on the intended purpose, different types of assessment can be used.

- **Baseline assessment:** At the beginning of a level or learning experience, baseline assessment establishes the knowledge, skills, values and attitudes (SKVAs) that learners bring to the classroom. This knowledge assists teachers to plan learning programmes and learning activities.
- **Diagnostic assessment:** This assessment diagnoses the nature and causes of barriers to learning experienced by specific learners. It is followed by guidance, appropriate support and intervention strategies. This type of assessment is useful to make referrals for learners requiring specialist help.

- **Formative assessment (Informal Assessment):** This assessment monitors and supports teaching and learning. It determines learners' strengths and weaknesses and provides feedback on progress. It determines if a learner is ready for summative assessment.
- **Summative assessment (Formal Assessment)** This type of assessment gives an overall picture of student progress at a given time. It determines whether the student is sufficiently competent to progress to the next level.

PUBLIC COMMENT

Planning Assessment

An assessment plan should cover three main processes:

- **Collecting evidence:** The assessment plan indicates which learning programme topics, content and skills will be assessed, what assessment method or activity will be used and when this assessment will be conducted.
- **Recording:** The process of recording refers to the assessment instruments or tools with which the assessment will be captured or recorded. Therefore, appropriate assessment instruments must be developed or adapted.
- **Reporting:** All the evidence is put together in a report to deliver a decision for the subject.

Methods of Assessment

Methods of assessment refer to who carries out the assessment and includes teacher assessment, self-assessment, peer assessment and group assessment.

TEACHER ASSESSMENT	The Teacher assesses learners' performance against given criteria in different contexts, such as individual work, group work, etc.
SELF-ASSESSMENT	Learners assess their own performance against given criteria in different contexts, such as individual work, group work, etc.
PEER ASSESSMENT	Learners assess another student or group of learners' performance against given criteria in different contexts, such as individual work, group work, etc.
GROUP ASSESSMENT	Learners assess the individual performance of other learners within a group or the overall performance of a group of learners against given criteria.

Task lists and **checklists** show the learners what needs to be done. They consist of short statements describing the expected performance in a particular task. The statements on the checklist can be ticked off when the learner has adequately achieved the criterion. Checklists and task lists are useful in peer or group assessment activities.

Rubrics are a hierarchy (graded levels) of criteria with benchmarks that describe the minimum level of acceptable performance or achievement for each criterion. It is a different way of assessment and cannot be compared to tests. Each criterion described in the rubric must be assessed separately. Mainly, two types of rubrics, namely holistic and analytical, are used.

Competence Descriptions

All assessment should award marks to evaluate specific assessment tasks. However, marks should be awarded against rubrics and not simply be a total of ticks for right answers. Rubrics should explain the competence level descriptors for the skills, knowledge, values and attitudes (SKVAs) a learner must demonstrate to achieve each level of the rating scale. When teachers or assessors prepare an assessment task or question, they must ensure that the task or question addresses an aspect of a topic or skill. The relevant content must be used to create the rubric to assess the task or question. The descriptions must clearly indicate the minimum level of attainment for each category on the rating scale.

Strategies for Collecting Evidence

A number of different assessment instruments may be used to collect and record evidence. Examples of instruments that can be (adapted and) used in the classroom include:

Record sheets: The teacher observes learners working in a group. These observations are recorded in a summary table at the end of each task. The teacher can design a record sheet to observe learners' interactive and problem-solving skills, attitudes towards group work and involvement in a group activity.

Checklists: Checklists should have clear categories to ensure that the objectives are effectively met. The categories should describe how the activities are evaluated and against what criteria they are evaluated. Space for comments is essential.

School Assessment Programme

The **Programme of Assessment** is designed to spread formal assessment tasks in all subjects in a school across a term.

The programme of assessment should be recorded in the Teacher's planning file (Portfolio of Assessment) for each subject.

The following should at least be included in the Teacher's File:

- A contents page;
- The formal schedule of assessment;
- The requirements for each assessment task;
- The tools used for each assessment task;
- Recording instrument(s) for each assessment task; and
- A mark sheet and report for each assessment task.

The learner's Evidence of Performance must at least include:

- A contents page;
- The assessment tasks according to the assessment programme as indicated below;
- The assessment tools or instruments for the task; and
- A record of the marks (and comments) achieved for each task.

Where tasks cannot be contained as evidence in the Portfolio of Evidence (PoE), its exact location must be recorded and it must be readily available for moderation purposes.

Assessment across the four years

Year 1 Reporting only in the term when the skill is done.

The GCE: Technical Occupational Qualification at NQF Level 1 is a four-year Learning Programme. In year one a learner is exposed to a number of Occupational Subjects. Each subject is offered over a ten-week period (one term) in Year 1, where the learner is exposed to the basic skills required for the subject. By the end of year 1 the learner will select a minimum of one skill for the qualification.

Year 1	Formal School-Based Assessments
	Learner performance in the Term:
	Practical 75%
	Theory 25%
Term Report	100%

Years 2 and 3

Year 2 will focus on a broad overview of the subject with a basic understanding and mastery of some of the basic skills required in the subject. Year 3 will focus on the consolidation of the basic skills and the addition of more advanced skills. Learners must in Year 3 start to develop a greater degree of independent mastery of the subject skills.

Year 2/3	Formal School-Based Assessments			Final End-of-Year Assessments
	Term 1	Term 2	Term 3	Term 4
	Practical 75%	Practical 75%	Practical 75%	o Practical 75%
	Theory 25%	Theory 25%	Theory 25%	
				o Pen and Paper Test/ Exam 25%
Term Report	100%	100%	100%	
End of Year	SBA 75%			25%

Year 4 Qualification year

In year 4 the focus shifts to the World of Work. Learners must consolidate required skills for the qualification and may engage in workplace exposure for a short period of time during the fourth year. Learners develop independent mastery of skills to be competent within the workplace

Year 4	Formal School-Based Assessments			Final End-of-Year Assessments
	Term 1	Term 2	Term 3	Term 4
	Practical 75%	Practical 75%	Practical 75%	External Practical Assessment Task 25%
	Theory 25%	Theory 25%	Theory 25%	
				External Pen and Paper Test 25%
Term Report	100%	100%	100%	
End of Year	SBA 50%			External Exams 50%

CLARIFICATION ON ASSESSMENT PERIODS

Year 2 and 3:

Term 1 theory assessment to consist of work done in term 1 only

Term 2 theory assessment to consist of work done in terms 1 and 2

Term 3 theory assessment to consist of work done in term 3 only

Term 4 theory assessment to consist of work done in terms 3 and 4

Year 4:

Term 1 theory assessment to consist of work done in term 1 only

Term 2 theory assessment to consist of work done in terms 1 and 2

Term 3 theory assessment to consist of work done in terms 1, 2 and 3

Term 4 Theory completed in the year

Timing of formal assessment

Suggested Program of Assessment for Plumbing

YEAR 1					
Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Year 1	Workshop safety Regulatory body's Hot and cold water supply Tools and tool safety Ladder safety, Identification and use of hand tools	Activity 1 E.g. Illustrate / show how water flows through a geyser	Demonstration	25%	FAT 1
		Activity 2 E.g. Measuring of pipes and small objects, making a small scoop	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	

YEAR 2					
Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Term 1	Workshop safety Regulatory body's Hot and cold water supply Tools and tool safety Ladder safety, Identification and use of hand tools	Activity 1 E.g. Illustrate / show how water flows through a geyser	Demonstration	25%	FAT 1
		Activity 2 E.g. Measuring of pipes and small objects, making a small scoop	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 2	Safety workshop rules' Identifying copper, brass, galvanized and plastic fitting Soldering and safety of soldering Measuring between pipe Identifying valves	Activity 1 E.g. Demonstrate simple process skill/s e.g. soldering	Demonstration	25%	FAT 2
		Activity 2 E.g. Fit valves to a system	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	

Term 3	Electrical safety Cisterns Valves Water quality Levelling	Activity 1 E.g. Strip and reassemble a cistern; make a concrete mix	Demonstration cis	25%	FAT 3
		Activity 2 E.g. Install a toilet and basin	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 4	Geyser SANS 10254	Activity 1 E.g. Installation of hot water system (a geyser according to SANS 10254)	Practical	75%	FAT 4
		Activity 2 Respond to questions	Pen and paper test (Oral or written)	25%	

YEAR 3					
Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Term 1	Safety: personal tool electrical ladder Handling of tools Identifying plumbing material and valves	Activity 1 E.g. Demonstrate simple safety process skill/s	Demonstration	25%	FAT 1
		Activity 2 E.g. Install a basin	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 2	Building drawings Installation of geyser Soldering Flushing systems	Activity 1 E.g. Demonstrate layout of a solar system or interpret site plans	Demonstration	25%	FAT 2
		Activity 2 E.g. Assemble/ install a flushing system	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	

Term 3	Installation maintenance and repair of solar water systems SANS 10106 Planning invoices	Activity 1 E.g. Identify components of solar panel and heat pump	Demonstration	25%	FAT 3
		Activity 2 E.g. Install a Solar panel & a heat pump.	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 4	Galvanized sheet metal work (gutters & downpipes)	Activity 1 E.g. Install guttering	Practical	75%	FAT 4
	Invoices Quotations and invoicing Valves & flushing systems Water cycle Calculations	Activity 2 Respond to questions	Pen and paper test (Oral or written)	25%	

YEAR 4					
Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Term 1	Safety Water cycle Tools and equipment Water supply Working with materials Calculations	Activity 1 E.g. Calculation – Measure cut pipes, and solder together	Demonstration	25%	FAT 1
		Activity 2 E.g. install geyser, solar or heat pump	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 2	Revision of term one SANS Flushing systems Sewerage Gutters and downpipes Quotations and invoicing Regulatory bodies	Activity 1 E.g. Demonstrate how a septic tank and French drain work., How a Solar water heater works, How a heat pump works	Demonstration	25%	FAT 2
		Activity 2 E.g. Install and repair a cistern; Make a 90- degree bend for a gutter; Identify sewerage fitting	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	

Term 3	Safety	Activity 1 E.g. Demonstrate how a geyser, solar and heat pump functions		Demonstration	25%	FAT 3
	Tools and material	Activity 2 E.g. Install a heat pump and or solar.		Practical	50%	
	Soldering	Activity 3 Respond to questions		Pen and paper test (Oral or written)	25%	
	Fitting					
	Valves					
	Flushing systems geysers					
	Solar and heat pumps					
	Quotations and invoicing					
Term 4	Core content and Concept across the years	External moderation of school assessment over terms 1, 2 and 3.			50%	GCE: TO Qualification
		Activity 1 Practical	Formal external Practical Assessment Task		25%	
		Activity 2 Respond to questions	Formal external assessment: Written test (or oral where necessary)		25%	

Recording and Reporting

Recording is a process in which the teacher documents the level of a learner's performance in a specific assessment task. It indicates learner progress towards the achievement of the knowledge and skill. Records of learner performance should provide evidence of the learner's progression. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process. Reporting is a process of communicating learner performance to learners, parents, schools, and other stakeholders. Learner performance can be reported in a number of ways. These include report cards, parents' meetings, school visitation days, parent-teacher conferences, phone calls, letters, class or school newsletters, etc.

Good record keeping is essential in all assessment, particularly in continuous assessment. A record book or file must be kept up to date by each teacher. It should contain:

- Learners' names;
- Dates of assessment;
- Name and description of the assessment activity;
- The results of assessment activities, according to Subject; and
- Comments for support purposes.

Teachers report in percentages against the subject. The various achievement levels and their corresponding percentage bands are as shown in the table below. Recording is a process in which the teacher documents the level of a learner's performance. Teachers record the actual raw marks against the task using a record sheet. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process. Records should be used to monitor learning and to plan ahead.

Note: The seven-point scale should have clear descriptions that give detailed information for each level. Teachers will record actual marks against the task by using a record sheet; and report percentages against the subject on the learners' report cards.

Codes and percentages for reporting

Rating code	Description of competence	Percentage	Nature of support provided to learners
7	Outstanding achievement	80 – 100	Independent
6	Meritorious achievement	70 – 79	Independent, verbal cues needed
5	Substantial achievement	60 – 69	Minimum support
4	Adequate achievement	50 – 59	Moderate support
3	Moderate achievement	40 – 49	Maximum support (Physical / Verbal)
2	Elementary achievement	30 – 39	Goals to be revisited – Change of direction required.
1	Not achieved	0 – 29	Little / no interest shown in the activity despite maximum support

All records must be accessible, easy to interpret, securely kept, confidential and helpful in the teaching and reporting process. The school assessment policy determines the details of how record books must be completed. Schools are required to provide quarterly feedback to parents on the Programme of Assessment, using a formal reporting tool, such as a report card. The schedule and the report card should indicate the overall level of performance of a learner.

NOTE:

Criterion referencing is best used to describe learner's performance in a skill. Teachers must make use of suitable analytical rubrics when assessing a learner's competence for a specific skill using practical demonstrations.

Progression and Promotion:

Learners will progress with age cohort in this Phase (Year 1-4). Where a learner does not meet the minimum requirements to be promoted to the next year then a learner may spend one extra year in the phase (Year 1-4) to strengthen their ability to achieve the qualification.

4.4 Moderation of Assessment

Moderation refers to the process that ensures that the assessment tasks are fair, valid and reliable. Moderation must be implemented at school, district, and provincial levels as required. Comprehensive and appropriate moderation practices must be in place for the quality assurance of all subject assessments. The Formal School Based Assessment and the practical assessment tasks must be moderated by the relevant subject specialists at the district and, if required, provincial levels in consultation with the moderators at school.

Moderation serves five purposes:

1. It must ascertain whether subject content and skills have been sufficiently covered.
2. The moderator must ensure that the correct balance of cognitive demands are reflected in the assessments.
3. The assessments and marking are of an acceptable standard and consistency.
4. The moderator must make judgements about the comparability of learner performance across schools; whilst recognising that teachers teach in different ways.
5. The subject specialist/moderator must identify areas in which a teacher may need development and support and must ensure that this support is provided.

4.4.1 Internal moderation

Assessment must be moderated according to the internal moderation policy of the School, Provincial and National Departments. Moderation is a continuous process. The moderator's involvement starts with the planning of assessment methods and instruments and follows with continuous collaboration with and support to the assessors. Internal moderation creates common understanding of topics and skills and maintains these across the learning programmes.

4.4.2 External moderation

External moderation is conducted by the Districts and or Provincial offices, Department of Basic Education, Umalusi and, where relevant, the QCTO. The external moderator:

- Monitors and evaluates the standard of all summative assessments;
- Maintains standards by exercising appropriate influence and control over assessors;
- Ensures proper procedures are followed;

- Ensures summative integrated assessments are correctly administered;
- Observes a minimum sample of 12 summative assessments in total;
- Gives written feedback to the relevant quality assessor; and
- Moderates in case of a dispute between an assessor and a student.

Policy on inclusive education requires that assessment procedures for students who experience barriers to learning be customised and supported to enable these students to achieve their maximum potential.

Moderation is therefore an on-going process and not a once-off end-of-year event.

4.5 General

This document should be read in conjunction with:

- White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001);
- *National Policy Pertaining to the Programme and Promotion Requirements of the National Curriculum Statement Grades R – 12*; and (NPPPPR) (2011);
- *National Protocol for Assessment Grades R – 12. (NPA) (2011);*
- *Guidelines for Responding to Diversity in the Classroom through the Curriculum and Assessment Policy Statements (2011);*
- *Guidelines to Ensure Quality Education and Support in Special Schools and Special School Resource Centres (2013);*
- *Policy on Screening, Identification, Assessment and Support (2014);*
- *Guidelines for Full-service/Inclusive Schools (2010); and*
- *Standard Operating Procedures for Assessment of Learners who Experience Barriers to Assessment (2016).*

SECTION 5

RESOURCES

Annexure A Theory Assessment

FINAL EXAMINATION PAPER

Year 1 (Draft)

Write in your school's name			
Technical: Plumbing	Assessment: Theory		Date:
Educators Name:	Year: 1		Term: 1
Leaners Name:	Oral	Written	Marks allocated

This assessment is marked out of 25marks.

Answer the questions below, choose the correct answer in the answer block below each question

Question 1 (5)

Name the following safety items that are used in the workshop?



.....



.....



.....

Answer Block

Hammer	Bench vice	Safety boots	Leather gloves
Welding helmet	Welding screen	Clear safety glasses	Leather apron

Question 2 (5)

Answer each one of the following questions either		Yes	No
1	Can the Plumbing Workshop be left dirty and untidy?	Y	N
2	When you hurt yourself in the Plumbing Workshop must you report it?	Y	N
3	Are there safety signs displayed in the plumbing Workshop?	Y	N
4	Can you work in the plumbing Workshop without safety equipment?	Y	N
5	Can you run and play around in the plumbing Workshop?	Y	N

Question 3 (5)

1. Identify 6 water born diseases?
2. Describe how water arrives to a tap?
3. What does SANS stand for?
4. SANS 10254 what does it stand for?
5. Where will you use the following tools:
Copper pipe cutter, shifting, bobojan (stilston rench), gas gun and a water pump pliers?
6. Measure pipes on board and fill in below:
 - a).....
 - b).....
 - c).....
 - d).....
 - e).....

Annexure B Practical Assessment

Your schools name												
Technical: Plumbing						Educator's Name:						
PRACTICAL PROJECT ASSESSMENT FOR END OF TERM												
NAME OF LEARNER:				CLASS: 1			TERM 1			Date		
Measuring of different pipe lengths												
Educators Comments:												
Educators recommendation:												
Fundamental Knowledge for Starting a Practical project											Total	
Does learner identify and apply safety equipment to start the practical project											5	
Can the learner identify and use the tools to do the project											5	
Has the learner followed safety procedures during manufacturing of practical project											5	
Can the learner interpret the drawing to manufacture practical project											5	
Does the learner's final project measure up to the picture/drawing that is supplied											5	
Fundamental Knowledge											25	
Assessment Rubric for Practical Projects												
#	Skill	1	2	3	4	5	6	7	8	9	10	Total
1	Measure											
2	Cut											
3	Accuracy											
4	Effort											
5	Implementation											
Add the learner's fundamental and practical marks. = 75%												

Annexure C Theory Assessment

Year 2 (Draft)

Your schools name			
Technical: Plumbing	Assessment: Theory		Date:
Educators Name:	Year: 2		Term: 1
Learners Name:	Oral	Written	Marks allocated:

This Assessment is marked out of 25 marks.

Answer the questions below, choose the correct answer in the answer block below each question

Question 1 (5)

1. Identify:

- a) Dangers in the workshop?
- b) Why protective clothing is worn?
- c) Tool safety?
- d) Ladder safety?
- e) What should not be done in the workshop?

Question 2

- 1. Brief description of regulatory body's?
- 2. Briefly describe a water treatment plant?
- 3. Identify different types of pipes?
- 4. Identify different types of fittings?
- 5. Name seven types of valves used in plumbing?

Question 3 (5)

What are the safety items you would use in the case of an accident or an emergency?

1. Name the items that you will use when a fire breaks out in the workshop?

.....

2. The item that you would put onto your hands before you start working?

.....

3. The opening that you will go through when you need to exit the workshop?

.....

4. The person that you must report all injuries and accidents to in the work-shop?

.....

5. What do you call the information boards that are in different colours posted all over the workshop?

Safety signs	Cell phone	Educator	Hard hat
Leather gloves	Fire hose	Nail polish	Doors

Question 4 (5)

1. Name five types of cisterns?
2. Name six important valves in a geyser installation?
3. Name four water type that affect plumbing?
4. Briefly explain how hot work is produced in a HWC?
5. Calculate a geyser installation?
6. Describe the function of anti-siphon loop.

Annexure D Practical Assessment

Your schools name here													
Technical: Plumbing							Educator's Name:						
PRACTICAL PROJECT ASSESSMENT FOR END OF TERM													
NAME OF LEARNER:					CLASS: 2			TERM 1			Date		
Install a WC close couple system?													
Fundamental Knowledge for Starting a Practical project												Total	
Does learner identify and apply safety equipment to start the practical project												5	
Can the learner identify and use the tools to do the project												5	
Has the learner followed safety procedures during manufacturing of practical project												5	
Can the learner interpret the drawing to manufacture practical project												5	
Does the learner's final project measure up to the picture/drawing that is supplied												5	
Fundamental Knowledge												25	
Assessment Rubric for Practical Projects													
#	Skill	1	2	3	4	5	6	7	8	9	10	Total	
1	Measure												
2	Cut												
3	Accuracy												
4	Effort												
5	Implementation												
Add the learner's fundamental and practical marks. = 75%													

Annexure E Theory Assessment

Year 3 (Draft)

Place Your Schools Name Here			
Technical: Plumbing	Assessment: Theory		Date:
Educators Name:	Year: 3		Term: 1
Leaners Name:	Oral	Written	Marks allocated:

This assessment is marked out of 25 marks.

Answer the questions below, choose the correct answer in the answer block below each question

Question 1

1. What would you check before climbing a ladder?
2. Identify different plumbing material?

Question 2

1. Identify the plumbing symbols shown?
2. Name what will affect a solar panels efficiency?
3. Name two types of solar panels?
4. Name five different solar systems?
5. Draw or describe the following:
 - a) Concealed cistern
 - b) Side entry
 - c) Bottom entry
 - d) Dual flush
 - e) Electronic system

Question 3 (5)

1. Produce a invoice of plumbing work?
2. Plan plumbing work (material, travelling expenses, sundries etc.
3. Why are the following valves important T&P, control valves, vacuum beakers, stop cocks and Drain cocks?
4. Explain ph of water?
5. Explain how you measure water pressure?
6. How would height affect water pressure?
7. How do you measure water flow?

Annexure F Practical Assessment

Your schools name												
Technical: Plumbing						Educator's Name:						
PRACTICAL PROJECT ASSESSMENT FOR END OF TERM												
NAME OF LEARNER:				CLASS: SOS 3			TERM 1			Date		
PICTURE/DRAWING OF PRACTICAL ASSESSMENT												
Install a geyser.												
Educators Comments:												
Fundamental Knowledge for Starting a Practical project											Total	
Does learner identify and apply safety equipment to start the practical project											5	
Can the learner identify and use the tools to do the project											5	
Has the learner followed safety procedures during manufacturing of practical project											5	
Can the learner interpret the drawing to manufacture practical project											5	
Does the learner's final project measure up to the picture/drawing that is supplied											5	
Fundamental Knowledge											25	
Assessment Rubric for Practical Projects												
#	Skill	1	2	3	4	5	6	7	8	9	10	Total
1	Measure											
2	Cut											
3	Solder											
4	Accuracy											
5	Speed											
Add the learner's fundamental and practical marks. = 75%												

Annexure G Theory Assessment

Year 4 (Draft)

Place Schools Name Here			
Technical: Plumbing	Assessment: Theory		Date:
Educators Name:	Year: 4		Term: 1
Learners Name:	Oral	Written	Marks allocated:

This assessment is marked out of 25 marks.

Answer the questions below, choose the correct answer in the answer block below each question

Question 1 (5)

1. Draw a geyser installation according to SANS?
2. Draw a heat pump installation according to SANS?
3. Draw a solar thermo siphon system?
4. Explain the operation of a T&P valve?
5. How a control valve functions?
6. What does a vacuum breaker do?
7. Why is there a drain cock?
8. Why is there a stop cock?
9. How does an anti siphon loop work?

Question 2 (5)

The following power tools are used in the work shop, choose the correct use for each one?



1. A 115mm angle grinder is used for



2. A portable hand drill can be used when

3. Give the SANS for the following:

10254

10252 part 1

10252 part 2

10600

10106

1352

3. Describe the use of a French drain?

4. Describe the use of a septic tank?

5. Describe the use of a grease trap?

6. Write a quote for a solar installation?

7. Name four regulatory body's

Question 3 (10)

Question 4 (5)

The following tools are used in the workshop; choose the correct answer for each tool?

1



..... Lubricate rusted and hard to losing items.

2



..... Cleans away rust and dirt from materials.

3



..... Make lines and marks on steel.

4



..... You can check that corners are square and 90 deg.

Annexure H Practical Assessment

Your schools name													
Technical: Plumbing							Educators Name:						
PRACTICAL PROJECT ASSESSMENT FOR END OF TERM													
NAME OF LEARNER:				year: 4			TERM 3			Date			
PICTURE/DRAWING OF PRACTICAL ASSESSMENT													
Install a heat pump?													
Fundamental Knowledge for Starting a Practical project												Total	
Does learner identify and apply safety equipment to start the practical project												5	
Can the learner identify and use the tools to do the project												5	
Has the learner followed safety procedures during manufacturing of practical project												5	
Can the learner interpret the drawing to install practical project												5	
Does the learner's final project measure up to the SANS												5	
Fundamental Knowledge												25	
Assessment Rubric for Practical Projects													
	Skills	1	2	3	4	5	6	7	8	9	10	Total	
1	Measure												
2	Cut												
3	Solder												
4	Speed												
5	Accuracy												
Add the learner's fundamental and practical marks. = 75%													