

National Curriculum of Pakistan
2022-23

TECHNICAL EDUCATION

WELDING (ARC & GAS)

Grades 9-10



NATIONAL CURRICULUM COUNCIL SECRETARIAT
MINISTRY OF FEDERAL EDUCATION AND
PROFESSIONAL TRAINING, ISLAMABAD
GOVERNMENT OF PAKISTAN

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It is with great pride that we, at the National Curriculum Council Secretariat, present the first core curriculum in Pakistan's 75-year history. Consistent with the right to education guaranteed by Article 25-A of our Constitution, the National Curriculum of Pakistan (2022-23) aspires to equip every child with the necessary tools required to thrive in and adapt to an ever-evolving globalized world.

The National Curriculum is in line with international benchmarks, yet sensitive to the economic, religious, and social needs of young scholars across Pakistan. As such, the National Curriculum aims to shift classroom instruction from rote learning to concept-based learning.

Concept-based learning permeates all aspects of the National Curriculum, aligning textbooks, teaching, classroom practice, and assessments to ensure compliance with contemplated student learning outcomes. Drawing on a rich tapestry of critical thinking exercises, students will acquire the confidence to embark on a journey of lifelong learning. They will further be able to acknowledge their weaknesses and develop an eagerness to build upon their strengths.

The National Curriculum was developed through a nationwide consultative process involving a wide range of stakeholders, including curriculum experts from the public, private, and non-governmental sectors. Representatives from provincial education departments, textbook boards, assessment departments, teacher training departments, *deeni madaris*, public and private publishers, private schools, and private school associations all contributed their expertise to ensure that the National Curriculum could meet the needs of all Pakistani students.

The experiences and collective wisdom of these diverse stakeholders enrich the National Curriculum, fostering the core, nation-building values of inclusion, harmony, and peace, making the National Curriculum truly representative of our nation's educational aspirations and diversity.

I take this opportunity to thank all stakeholders, including students, teachers, and parents who contributed to developing the National Curriculum of Pakistan (2022-23)

Dr. Mariam Chughtai

Director

National Curriculum Council Secretariat

Ministry of Federal Education and Professional Training

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Progression Grid

Domain A: Introduction to Welding

Standard: Students will be able to explain the welding process and differentiate major kinds of welding, uses of fusion and pressure welding in the real-world.

Grade 9	Grade 10
Benchmark I: Students will be able to define welding, its types, explain two major kinds and their uses in the real-world.	
Student Learning Outcomes	
[SLO:WD-09-A-01]: Students will define welding.	
[SLO:WD-09-A-02]: Students classify welding w.r.t its two major types (i.e., Fusion welding and pressure welding).	
[SLO:WD-09-A-03]: Students will explain fusion welding	
[SLO:WD-09-A-04]: Students will describe the purposes of fusion welding.	
[SLO:WD-09-A-05]: Students will describe benefits of fusion welding	
Benchmark II: Students explain pressure welding, classify it in major types.	

Student Learning Outcomes	
<p>[SLO:WD-09-A-06]: Students will define pressure welding.</p> <p>[SLO:WD-09-A-07]: Students will classify pressure welding.</p> <p>[SLO:WD-09-A-08]: Students will explain the purposes of pressure welding.</p> <p>[SLO:WD-09-A-09]: Students will explain the benefits of pressure welding.</p>	

Domain B: Basics of Arc and Gas welding

Standard: Students explain Arc and gas welding. Students will describe types of Arc and gas welding and their uses in the workplace.

Grade 9	Grade 10
<p>Benchmark I: Students will be able to define Electric Arc welding, its types and the uses in the real world.</p>	<p>Benchmark I: Students will be able to define gas welding, classify its major types and their uses in the real world.</p>
Student Learning Outcomes	
<p>[SLO:WD-09-B-01]: Students will define electric arc welding.</p> <p>[SLO:WD-09-B-02]: Students will explain types of electric arc welding.</p>	<p>[SLO:WD-10-B-01]: Students will explain gas welding.</p> <p>[SLO:WD-10-B-02]: Students will classify gas welding (i.e., low pressure and high pressure gas welding).</p>

<p>[SLO:WD-09-B-03]: Students will analyze the uses of electric arc welding.</p>	<p>[SLO:WD-10-B-03]: Students will explain oxy acetylene gas welding.</p> <p>[SLO:WD-10-B-04]: Students will describe the use of the Oxy-acetylene gas welding.</p>
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Domain C: Equipments and tools of ARC and gas welding, their types and uses

Standard: students understand the types and uses of Arc welding machines /plants, arc and gas welding tools, gas cylinders and regulators,

<p>Benchmark I: Students will define tools and equipment of arc welding , understand their types and uses in real world</p>	<p>Benchmark I: Students will define tools and equipment of gas welding, understand their types and uses in real world</p>
<p>Grade 9</p>	<p>Grade 10</p>
<p>Student Learning Outcomes</p>	
<p>[SLO:WD-09-C-01]: Students will identify various arc welding tools.</p> <p>[SLO:WD-09-C-02]: Students will differentiate AC welding transfer, DC generator and welding rectifier.</p> <p>[SLO:WD-09-C-03]: Students will describe the use of Step up and Step down transformers.</p>	<p>[SLO:WD-10-C-01]: Students will identify various gas welding tools and equipment.</p> <p>[SLO:WD-10-C-02]: Students will classify various types of gasses (oxygen, nitrogen, carbon, acetylene gasses used in gas welding.</p> <p>[SLO:WD-10-C-03]: Students will describe uses of gasses in gas welding.</p> <p>[SLO:WD-10-C-04]:</p>

	Students will recognize the uses of gas welding tools in gas welding.
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Domain D: Arc and gas welding and Gas cutting Procedures

Standard: students understand Arc and Gas welding and cutting procedure, tools used for gas cutting.

Benchmark I: Students will be able to define Arc welding procedure.	Benchmark I: Students will be able to explain gas welding procedures.
Grade 9	Grade 10
Student Learning Outcomes	
[SLO:WD-09-D-01]: Students will explain the procedure of Arc welding in the workplace.	[SLO:WD-10-D-01]: Students will recognize the gas cutting torch, its functions and types.
[SLO:WD-09-D-02]: Students will explain the procedure of metal cutting through Arc welding in the workplace	[SLO:WD-10-D-02]: Students will explain the gas cutting process.
Benchmark I: Students will be able to explain Arc welding in different positions	Benchmark I: Students will be able to recognize gas welding in different positions
Grade 9	Grade 10
Student Learning Outcomes	
[SLO:WD-09-D-03]: Students will explain the procedure of Arc welding in the	[SLO:WD-10-D-03]: Students will recognize the gas cutting torch, its

workplace. [SLO:WD-09-D-04]: Students will explain the procedure of metal cutting through Arc welding in the workplace	functions and types. [SLO:WD-10-D-04]: Students will explain the gas cutting process.
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Domain E: Safety precaution practices during the process of Electric Arc welding and gas welding.

Standard: Students will be able to adopt and understand safety precautions of ARC and gas welding, apply safety precautions of Arc welding plants and gas welding cylinders.

Benchmark I: Students understand and apply general and specific safety precaution of a welding workshop	
Grade 9	Grade 10
Student Learning Outcomes	

[SLO:WD-09-E-01]: Students will understand general safety practices adopted in arc welding workshops.	[SLO:WD-10-E-01]: Students will understand general safety practices adopted in gas welding workshops.
[SLO:WD-09-E-02]: Students will understand specific safety precautions of arc welding.	[SLO:WD-10-E-02]: Students will understand specific safety precautions of gas welding.
Benchmark II: Students will be able to handle equipment and tools of arc and gas welding with care.	
Student Learning Outcomes	
[SLO:WD-09-E-03]: Students will describe safety practices of arc welding plants.	[SLO:WD-10-E-03]: Students will understand proper handling of gas cylinders

[SLO:WD-09-E-04]: Students will describe safety practices of electrode holders.	SLO:WD-10-E-04: Students will explain safety practices of blow pipe and rubber hose.
	[SLO:WD-10-E-05]: Students will understand back-fire and flashback in the gas welding process.

Domain F: Practical implications of arc and gas welding in the workplace.

Standard Y: Students explain and get skills to make welding joints, gas welding flames, perform arc and gas welding in different positions .

Grade 9	Grade 10
Benchmark I: Students explain different welding joints, their uses and procedures to make these joints	Benchmark I: Students will understand types of gas welding, flames, their uses and procedure to make these flames in the workshop.
Student Learning Outcomes	
[SLO:WD-09-F-01]: Students will define welding joints.	[SLO:WD-10-F-01]: Students will describe gas welding flames.
[SLO:WD-09-F-02]: Students will explain the types of welding joints	[SLO:WD-10-F-02]: Students will recognize types of gas flames.
[SLO:WD-09-F-03]: Students will describe the uses of these welding joints..	[SLO:WD-10-F-03]: Students will become able to explain the process of making gas flames.

Benchmark II: students understand and get skill to make U joint and V joint.	
Student Learning Outcomes	
[SLO:WD-09-F-04]: Students will get skills to make V joints.	
[SLO:WD-09-F-05]: Students will get skills to make U joints.	

Domain G: Modern Welding Techniques of ARC and Gas Welding

Standard Y: Students will be able to practice modern techniques of ARC and gas welding in the workplace.

Benchmark II: students describe modern techniques of arc and gas welding (Thermit welding, TIG welding, MIG welding, Submerged Arc welding), explain the benefits and their uses in the real world.	
Student Learning Outcomes	
[SLO:WD-09-G-01]: Students will explain Thermit welding	[SLO:WD-10-G-01]: Students will recognize TIG welding.
[SLO:WD-09-G-02]: Students will explain Submerged Arc Welding.	[SLO:WD-10-G-02]: Students will understand MIG welding.
[SLO:WD-09-G-03]: Students will describe the purposes of modern arc welding techniques.	[SLO:WD-10-G-03]: Students will describe the purposes of modern gas welding techniques.



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