City & Guilds Entry Level 3, Level 1 Award and Level 2 Certificate in Cycle Mechanics (3902-08-18-28)

Version 1.3 (September 2024)

Qualification Handbook

Qualification at a glance

Subject area	Transportation operations and maintenance
City & Guilds number	3902-08-18-28
Age group approved	All ages
Entry requirements	n/a
Assessment	Practical demonstration/assignment
Grading	Pass/Fail
Approvals	Automatic approval/Full approval required
Support materials	Assessment pack
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds qualification number	Regulatory reference number	GLH	TQT
City & Guilds Entry Level 3 Award in Cycle Mechanics	3902-08	600/0659/6	25	50
City & Guilds Level 1 Award in Cycle Mechanics	3902-18	600/0495/2	31	60
City & Guilds Level 2 Certificate in Cycle Mechanics	3902-28	600/0660/2	103	200

Version and date	Change detail	Section
1.0 January 2011	Initial version	All
1.1 April 2013	Removed references to Assessment Answer Pack	Qualification at a glance, Assessment
1.2 August 2017	Added TQT details Deleted QCF	Qualification a a glance, Structure Throughout
1.3 September 2024	Handbook reviewed and updated to new template Added assessment strategy section	Throughout Assessment

Contents

Qualification at a glance 2

Contents 4

1 Introduction 6

Structure 7

Total Qualification Time (TQT) 10

2 Centre requirements 11

Approval 11

Resource requirements 12

Quality assurance 12

Learner entry requirements 13

Age restrictions 13

Access arrangements and reasonable adjustments 13

3 Delivering the qualification 14

Initial assessment and induction 14

Inclusion and diversity 14

Sustainability 14

Support materials 15

4 Assessment 16

Assessment of the qualification 16

Assessment strategy 16

Portfolio of evidence Error! Bookmark not defined.

Evidence sources Error! Bookmark not defined.

Time constraints 17

Recognition of prior learning (RPL) Error! Bookmark not defined.

5 Units 18

Structure of the units 18

Guidance for delivery of the units 18

Unit 081 Remove and replace cycle wheels, tyres and inner tubes 19

Unit 082 Remove and replace cycle brake blocks 21

Unit 083 Lubricate and tension a single speed cycle chain 23

Unit 084 Remove and replace cycle saddles, seatposts and adjust handlebars 25

Unit 085	**Clean and prepare a cycle for use**	**27**
Unit 181	**Repair a cycle puncture**	**29**
Unit 182	**Remove and replace a cycle rim brake assembly**	**32**
Unit 183	**Remove and replace a cycle gear assembly**	**35**
Unit 184	**Carry out a systematic cycle check**	**39**
Unit 281	**Remove and replace cycle tubular and tubeless tyres**	**42**
Unit 282	**Remove and replace cycle braking systems**	**45**
Unit 283	**Remove and replace cycle gear systems**	**48**
Unit 284	**Remove and replace cycle hub bearings**	**51**
Unit 285	**Remove and replace cycle bottom brackets and crank**	**54**
Unit 286	**Build a cycle wheel**	**57**
Unit 287	**Prepare frames and forks for cycle assembly**	**60**
Unit 288	**Augment a cycle**	**63**
Unit 289	**Change a cycle frame**	**66**
Unit 290	**Service cycle headsets assemblies**	**70**
Appendix 1	**Sources of general information**	**73**

1 Introduction

This document tells you what you need to do to deliver the qualifications:

Area	Description
Who are the qualifications for?	These qualification(s) are for those individuals who want to develop some of the key skills and understanding in building, servicing, repair and maintenance of all types of cycles. These qualifications could also be used as 'interest' courses for a wide range of learners.
What do the qualifications cover?	Candidates will learn, develop and practise the skills required for employment and/or career progression in the cycle maintenance and building sector.
What opportunities for progression are there?	Candidates can progress into employment or to the following City & Guilds qualifications: • Level 1 Award in Cycle Mechanics • Level 2 Certificate in Cycle Mechanics In addition, candidates who enjoy leading teams of people at work could also move onto a qualification as a Team Leader or Supervisor such as qualifications at Levels 2 or 3 through the Institute of Leadership and Management (ILM).
Who did we develop the qualifications with?	N/A
Is it part of an apprenticeship framework or initiative?	No

Structure

To achieve the City & Guilds Entry Level 3 Award in Cycle Mechanics, learners must achieve 5 credits from the mandatory units plus any additional credits from the elective units:

City & Guilds unit number	Unit title	Credit value
Mandatory units:		
Learners must achieve all **five** mandatory units.		
081	Remove and replace cycle wheels, tyres and inner tubes	1
082	Remove and replace cycle brake blocks	1
083	Lubricate and tension a single speed cycle chain	1
084	Remove and replace cycle saddles, seat posts and adjust handlebars	1
085	Clean and prepare a cycle for use	1
Elective units:		
181	Repair a cycle puncture	1
182	Remove and replace a cycle rim brake assembly	2
183	Remove and replace a cycle gear assembly	2
184	Carry out a systematic cycle check	1

To achieve the City & Guilds Level 1 Award in Cycle Mechanics, learners must achieve6 credits from the mandatory units plus any additional credits from the elective units:

City & Guilds unit number	Unit title	Credit value
Mandatory units:		
Learners must achieve all **five** mandatory units.		
181	Repair a cycle puncture	1
182	Remove and replace a cycle rim brake assembly	2
183	Remove and replace a cycle gear assembly	2
184	Carry out a systematic cycle check	1
Elective units:		
281	Remove and replace cycle tubular and tubeless tyres	1
282	Remove and replace cycle braking systems	2
283	Remove and replace cycle gear systems	2
284	Remove and replace cycle hub bearings	2
285	Remove and replace cycle bottom brackets and cranks	2
286	Build a cycle wheel	3
287	Prepare frames and forks for cycle assembly	1
288	Augment a cycle	2
289	Change a cycle frame	2
290	Service cycle headsets assemblies	2

To achieve the City & Guilds Level 2 Certificate in Cycle Mechanics, learners must achieve a minimum of 20 credits from the mandatory units plus any additional credits from the elective units:

City & Guilds unit number	Unit title	Credit value
Mandatory units:		
Learners must achieve all **12** mandatory units.		
181	Repair a cycle puncture	1
182	Remove and replace a cycle rim brake assembly	2
184	Carry out a systematic cycle check	1
283	Remove and replace cycle gear systems	2
284	Remove and replace cycle hub bearings	2
285	Remove and replace cycle bottom brackets and cranks	2
286	Build a cycle wheel	3
287	Prepare frames and forks for cycle assembly	1
288	Augment a cycle	2
289	Change a cycle frame	2
290	Service cycle headsets assemblies	2
Elective units:		
281	Remove and replace cycle tubular and tubeless tyres	1
282	Remove and replace cycle braking systems	2

Total Qualification Time (TQT)

Total Qualification Time (TQT) is the number of notional hours which represents an estimate of the total amount of time that could reasonably be expected for a learner to demonstrate the achievement of the level of attainment necessary for the award of a qualification.

TQT comprises of the following two elements:

1) the number of hours that an awarding organisation has assigned to a qualification for guided learning
2) an estimate of the number of hours a learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place as directed by – but, unlike guided learning, not under the immediate guidance or supervision of – a lecturer, supervisor, tutor or other appropriate provider of education or training.

Title and level	GLH	TQT
City & Guilds Entry Level 3 Award in Cycle Mechanics	25	50
City & Guilds Level 1 Award in Cycle Mechanics	31	60
City & Guilds Level 2 Certificate in Cycle Mechanics	103	200

2 Centre requirements

Approval

Full approval

To offer these qualifications, new centres will need to gain both centre and qualification approval. Please refer to the document **Centre Approval Process: Quality Assurance Standards** for further information.

Automatic approval

If your centre is approved to offer the Cycle Maintenance and Repair Skills qualifications (3993-01) you will be automatically approved to offer the new City & Guilds Entry Level 3 Award, Level 1 Award and Level 2 Certificate in Cycle Mechanics. Please refer to the document **Centre Approval Process: Quality Assurance Standards** for further information.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification before designing a course programme.

Resource requirements

Centre staffing

Staff delivering these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be occupationally competent or technically knowledgeable in the area(s) for which they are delivering training and/or have experience of providing training (this knowledge must be to the same level as the training being delivered)
- have recent relevant experience in the specific area they will be assessing
- have credible experience of providing training.

Continuing professional development (CPD)

Centres are expected to support their staff in ensuring that their knowledge remains current of the occupational area and of best practice in delivery, mentoring, training, assessment and quality assurance, and that it takes account of any national or legislative developments.

Quality assurance

Approved centres must have effective quality assurance systems to ensure optimum delivery and assessment of qualifications. Quality assurance includes initial centre approval, qualification approval and the centre's own internal procedures for monitoring quality. Centres are responsible for internal quality assurance and City & Guilds is responsible for external quality assurance. All external quality assurance processes reflect the minimum requirements for verified and moderated assessments, as detailed in the Centre Assessment Standards Scrutiny (CASS), section H2 of Ofqual's General Conditions. For more information on both CASS and City and Guilds Quality Assurance processes visit: the What is CASS? and Quality Assurance Standards documents on the City & Guilds website.

Standards and rigorous quality assurance are maintained by the use of:

- Internal quality assurance
- City & Guilds external quality assurance.

In order to carry out the quality assurance role, Internal Quality Assurers must

- have appropriate teaching and vocational knowledge and expertise
- have experience in quality management/internal quality assurance
- hold or be working towards an appropriate teaching/training/assessing qualification
- be familiar with the occupation and technical content covered within the qualification.

External quality assurance for the qualification will be provided by City & Guilds EQA process. EQAs are appointed by City & Guilds to approve centres, and to monitor the assessment and internal quality assurance carried out by centres. External quality assurance is carried out to ensure that assessment is valid and reliable, and that there is good assessment practice in centres.

The role of the EQA is to:

- provide advice and support to centre staff
- ensure the quality and consistency of assessments and marking/grading within and between centres by the use of systematic sampling
- provide feedback to centres and to City & Guilds.

Learner entry requirements

City & Guilds does not set entry requirements for these qualifications. However, centres must ensure that candidates have the potential and opportunity to gain the qualification successfully.

Age restrictions

There is no age restriction for these qualifications.

Access arrangements and reasonable adjustments

City & Guilds has considered the design of these qualifications and their assessments in order to best support accessibility and inclusion for all learners. We understand however that individuals have diverse learning needs and may require reasonable adjustments to fully participate. Reasonable adjustments, such as additional time or alternative formats, may be provided to accommodate learners with disabilities and support fair access to assessment.

Access arrangements are adjustments that allow candidates with disabilities, special educational needs, and temporary injuries to access the assessment and demonstrate their skills and knowledge without changing the demands of the assessment. These arrangements must be made before assessment takes place.

Equality legislation requires City & Guilds to make reasonable adjustments where a disabled person would be at a substantial disadvantage in undertaking an assessment.

It is the responsibility of the centre to ensure at the start of a programme of learning that candidates will be able to access the requirements of the qualification.

Please refer to the Joint Council for Qualifications (JCQ) access arrangements and reasonable adjustments and access arrangements - when and how applications need to be made to City & Guilds. For more information documents are available on the City & Guilds website.

3 Delivering the qualification

Initial assessment and induction

An initial assessment of each learner should be made before the start of their programme to identify:

- if the learner has any specific training needs
- support and guidance they may need when working towards their qualifications
- any units they have already completed or credit they have accumulated which is relevant to the qualification
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the learner fully understands the requirements of the qualifications, their responsibilities as a learner and the responsibilities of the centre. This information can be recorded on a learning contract.

Inclusion and diversity

City & Guilds is committed to improving inclusion and diversity within the way we work and how we deliver our purpose which is to help people and organisations develop the skills they need for growth.

More information and guidance to support centres in supporting inclusion and diversity through the delivery of City & Guilds qualifications can be found here:

Inclusion and diversity | City & Guilds (cityandguilds.com)

Sustainability

City & Guilds are committed to net zero. Our ambition is to reduce our carbon emissions by at least 50% before 2030 and develop environmentally responsible operations to achieve net zero by 2040 or sooner if we can. City & Guilds is committed to supporting qualifications that support our customers to consider sustainability and their environmental footprint.

More information and guidance to support centres in developing sustainable practices through the delivery of City & Guilds qualifications can be found here:

Our Pathway to Net Zero | City & Guilds (cityandguilds.com)

Centres should consider their own carbon footprint when delivering this qualification and consider reasonable and practical ways of delivering this qualification with sustainability in mind. This could include:

- reviewing purchasing and procurement processes (such as buying in bulk to reduce the amount of travel time and energy, considering and investing in the use of components that can be reused, instead of the use of disposable or single use consumables)

- reusing components wherever possible
- waste procedures (ensuring that waste is minimised, recycling of components is in place wherever possible)
- minimising water use and considering options for reuse/salvage as part of plumbing activities wherever possible.

Support materials

The following resources are available for these qualifications:

Description	How to access
Assessment pack for centres	www.cityandguilds.com

4 Assessment

Assessment of the qualification

Candidates must:

- successfully complete one assignment for each mandatory unit

Assessment strategy

City & Guilds has written assignments for each unit in this suite of qualifications which are available in the Assessment Pack for Centres at www.cityandguilds.com.

City and Guilds does not permit centres to modify these materials in any way. All assessment materials must be held securely by centres and not made available to candidates until the time of their assessment.

Each assignment is made up of two tasks:

· Task A: Practical assessment

· Task B: Knowledge assessment

Task A Practical Assignment

The cycles used for assessment should have a realistic resemblance to current cycles. Suggested cycle types include; road bikes, mountain bikes, hybrid bikes, BMX bikes or utility bikes. Centres can use whole cycles or specially prepared realistic cycle rigs (where appropriate) for training and assessment. It is expected that the technology used is similar to that used in the workplace today.

Due to importance of the practical observations as part of the assessment for this qualification, there is a maximum of 1:10 assessor candidate ratio. Additional support in the observation of candidates could be the use of higher level candidates (not peers) to support assessment decisions.

Learners must successfully complete all parts of the practical assessment to pass.

Tools and equipment

Providers should have the tools and equipment to facilitate the cycle types and units being worked upon; they should be in a safe condition to support learning and assessment.

Health and safety requirements

Health and safety should be maintained at all times during practical assessments by candidates and assessors. If a candidate fails to act in a safe manner, their practical assessment must be stopped and the candidate will be required to re-sit the task at a later date after being briefed on how they compromised their health and safety.

Task B Knowledge Assignment

The knowledge tasks are in the form of short-answer questions which should be taken under supervised conditions as closed-book tests. This means that all activities will be completed with the assessor, or other designated supervisor, present. Strict exam regulations do not apply; it is envisaged that most candidates will take the short-answer questions in their normal learning environment with their own tutor present.

Alternatively, assessors may prefer to ask the questions orally and record individual candidates' responses.

Assessments are marked by the centre using the marking guide provided in the relevant Centre Assessment Pack which are available to download from **www.cityandguilds.com**.

The pass marks for the knowledge tasks for each unit are recorded in the assessment pack. Candidates must pass both Task A and Task B to achieve the unit.

Time constraints

The following must be applied to the assessment of these qualifications:

Timings for each practical task are given in the assessment pack. There is no time limit set by City & Guilds for the knowledge assignments.

5 Units

Structure of the units

These units each have the following:

- City & Guilds reference number
- Unit accreditation number (UAN)
- title
- level
- guided learning hours (GLH)
- credit value
- unit aim
- learning outcomes, which are comprised of a number of assessment criteria
- range statements
- supporting information

Guidance for delivery of the units

These qualifications comprise a number of **units**. A unit describes what is expected of a competent person in particular aspects of their job.

Each **unit** is divided into **learning outcomes** which describe in further detail the skills and knowledge that a candidate should possess.

Each **learning outcome** has a set of **assessment criteria** (performance and knowledge and understanding) which specify the desired criteria that must be satisfied before an individual can be said to have performed to the agreed standard.

Range statements define the breadth or scope of a learning outcome and its assessment criteria by setting out the various circumstances in which they are to be applied.

Supporting information provides guidance of the evidence requirement for the unit and specific guidance on delivery and range statements. Centres are advised to review this information carefully before delivering the unit.

Unit 081 Remove and replace cycle wheels, tyres and inner tubes

UAN:	T/502/6971
Level:	Entry 3
Credit	1
GLH:	5
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the basic skills and knowledge required to remove and replace cycle wheels, tyres and inner tubes.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when removing and replacing wheels, tyres and inner tubes

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when working on cycle wheels, tyres and inner tubes

AC1.2 Safely handle and dispose of used wheels, tyres and inner tubes

AC1.3 Safely handle and support cycle and wheels when removing and replacing wheels, tyres and inner tubes

AC1.4 Identify the people that must be informed of the progress on the work being undertaken.

Learning outcome

The learner will:

LO2 Know how cycle wheels, tyres and inner tubes function

Assessment criteria

The learner can:

AC2.1 List the **components** which are relevant to the removal and replacement of cycle wheels, tyres and inner tubes

AC2.2 State the basic function of:

a. a tyre
b. an inner tube
c. fasteners.

Range

AC2.1 **Components** - wheel, tyre, inner tubes, wheel nuts, quick release skewer

---

Learning outcome

The learner will:

LO3 Be able to carry out the removal and replacement of wheels, tyres and inner tubes

Assessment criteria

The learner can:

AC3.1 Use the **equipment** required to carry out the removal and replacement of wheels, tyres, inner tubes and fastenings

AC3.2 Demonstrate the removal and replacement of the front and rear wheels, tyres and inner tubes

AC3.3 Demonstrate undoing and tightening fasteners associated with cycle wheels

AC3.4 Identify cosmetic damage of cycle components and inform the relevant person.

Range

AC3.1 **Equipment** - spanner, tyre levers, quick release skewer, pump

Unit 082 Remove and replace cycle brake blocks

UAN:	J/502/7252
Level:	Entry 3
Credit:	1
GLH:	5
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the basic skills and knowledge required to remove and replace cycle brake blocks.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when removing and replacing brake blocks

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when working on cycle brake blocks
AC1.2 Safely handle and dispose of used brake blocks
AC1.3 Safely handle and support a cycle when removing and replacing brake blocks
AC1.4 Identify the people that must be informed of the progress on the work being undertaken.

Learning outcome

The learner will:

LO2 Know how cycle brake blocks function

Assessment criteria

The learner can:

AC2.1 List the **components** which are relevant to the removal and replacement of brake blocks
AC2.2 State the basic function of cycle:

a. brakes
b. brake blocks
c. brake cables
d. brake levers.

Range

AC2.1 **Components** - cable, barrel adjuster, brake block

Learning outcome

The learner will:

LO3 Be able to carry out the removal and replacement of brake blocks

Assessment criteria

The learner can:

AC3.1 Use the equipment required to carry out the removal and replacement of **brake blocks**
AC3.2 Demonstrate the removal and replacement of **brake blocks**
AC3.3 Demonstrate undoing and tightening fasteners associated with **brake blocks**
AC3.4 Identify cosmetic damage of cycle components and inform the relevant person.

Range

Brake blocks - v-type

Unit 083 Lubricate and tension a single speed cycle chain

UAN:	L/502/7253
Level:	Entry 3
Credit:	1
GLH:	9
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the basic skills and knowledge required to lubricate and tension a single speed cycle chain.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when lubricating and tensioning the chain of a single speed cycle

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when lubricating and tensioning a single speed cycle chain
AC1.2 Safely handle and dispose of used chains
AC1.3 Safely handle and support a cycle when lubricating and tensioning the chain of a single speed cycle
AC1.4 Identify the people that must be informed of the progress on the work being undertaken.

Learning outcome

The learner will:

LO2 Know how cycle chains function

Assessment criteria

The learner can:

AC2.1 List the **components** which are relevant to the lubrication and tensioning of a single speed cycle chain
AC2.2 State the basic function of:

a. chain
b. chain tension
c. chain lubrication.

Range

AC2.1 **Components** - chain sprocket, chain, chain ring, wheel fasteners

---

Learning outcome

The learner will:

LO3 Be able to carry out the lubrication and tensioning of a single speed chain

Assessment criteria

The learner can:

AC3.1 Use the equipment required to carry out lubrication and tensioning of a single speed cycle chain
AC3.2 Demonstrate the lubrication of a single speed cycle chain
AC3.3 Demonstrate the tensioning of a single speed cycle chain
AC3.4 Demonstrate undoing and tightening fasteners associated with tensioning of a single speed cycle chain
AC3.5 Identify cosmetic damage of cycle components and inform the relevant person.

Unit 084 Remove and replace cycle saddles, seatposts and adjust handlebars

UAN:	D/502/7273
Level:	Entry 3
Credit:	1
GLH:	5
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the basic skills and knowledge required to remove and replace cycle saddles, seatposts and adjust handlebars.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely removing and replacing saddles, seatposts and adjusting handlebars of a cycle

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when working on saddles, seatposts and adjusting handlebars of cycles

AC1.2 Safely handle and dispose of used saddles and seatposts of a cycle

AC1.3 Safely handle and support a cycle when working on saddles, seatposts and adjusting handlebars of cycles

AC1.4 Identify the people that must be informed of the progress of work undertaken

Learning outcome

The learner will:

LO2 Know how cycle saddles, seatposts and handlebars function

Assessment criteria

The learner can:

AC2.1 List the **components** which are relevant to saddles, seatposts and handlebars of cycles
AC2.2 State the basic function of:

a. saddles
b. seatposts
c. handlebars
d. seatpost limit marks.

Range

AC2.1 **Components** - handle bars, stem, seatposts and saddle, seat pin binder

Learning outcome

The learner will:

LO3 Be able to carry out the removal and replacement of saddles, seatposts and adjustment handlebars of cycles

Assessment criteria

The learner can:

AC3.1 Use the equipment required to carry out the removal and replacement of saddles, seatposts and adjustment of handlebars of cycles
AC3.2 Demonstrate the removal and replacement of saddles, seatposts and adjustment of handlebars of cycles
AC3.3 Demonstrate undoing and tightening fasteners associated with the removal and replacement of saddles, seatposts and adjustment of handlebars of cycles
AC3.4 Identify cosmetic damage of cycle components and inform the relevant person.

Unit 085 Clean and prepare a cycle for use

UAN:	L/502/7320
Level:	Entry 3
Credit:	1
GLH:	5
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the basic skills and knowledge required to clean and prepare a cycle for use.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when cleaning and preparing a cycle for use

Assessment criteria

The learner can:

AC1.1 Use appropriate **Personal Protective Equipment** and safety methods when cleaning and preparing a cycle for use

AC1.2 Safely handle and dispose of cleaning materials and substances used when cleaning and preparing a cycle for use

AC1.3 Safely handle and support a cycle during cleaning and preparation for use

AC1.4 Identify the people that must be informed of the progress on the work being undertaken.

Range

AC1.1 **Personal Protective Equipment** – safe, road worthy, clean

Learning outcome

The learner will:

LO2 Know how cycle cleaning and finishing products work

Assessment criteria

The learner can:

AC2.1 State the function of:
- a. solvent
- b. detergent
- c. lubricant.

Learning outcome

The learner will:

LO3 Be able to carry out the cleaning and preparation of a cycle for use

Assessment criteria

The learner can:

AC3.1 Use the materials required to carry out the cleaning and preparation of a cycle for use
AC3.2 Demonstrate how to clean a cycle
AC3.3 Demonstrate a **basic safety check** of a cycle
AC3.4 Identify cosmetic damage of cycle components and inform the relevant person.

Range

AC3.3 **Basic safety check** – ABC (air, brakes, chain)

Unit 181 Repair a cycle puncture

UAN:	R/502/7321
Level:	Level 1
Credit:	1
GLH:	5
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to repair a puncture on a rear wheel.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when repairing a puncture on a rear wheel

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when repairing a puncture on a rear wheel
AC1.2 Demonstrate **Health and Safety workplace procedures** when repairing a puncture
AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials when repairing a puncture
AC1.4 Work minimising the risk of damage to the cycle, its systems, the environment, other people and their property
AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health and Safety workplace procedures** – follow manufacturer's instructions, ventilation

Learning outcome

The learner will:

LO2 Be able to use relevant sources of information when repairing a puncture on a rear wheel

Assessment criteria

The learner can:

AC2.1 Ensure that records for cycles, wheels, tyres and inner tubes are accurate
AC2.2 Follow correct **technical data** for puncture repair.

Range

AC2.2 **Technical data** - recommended tyre/rim pressures, manufacturer's instructions

Learning outcome

The learner will:

LO3 Know how cycle wheel rims, tyres and inner tubes function

Assessment criteria

The learner can:

AC3.1 identify the major **components** which are relevant to the removal and replacement of cycle wheels, tyres and inner tubes and the repair of punctures.
AC3.2 identify the **common sizes** and types of:

a. wheel
b. tyres
c. inner tubes
d. **valves**
e. **repair patches**

AC3.3 outline the function of:

a wheels
b. tyres
c. inner tubes
d. fasteners
e. **repair patches**
f. **valves**

AC3.4 state causes of different types of punctures.

Range

AC3.1 **Components** - rim tape, wheels, tyres, inner tubes, fasteners, valves

AC3.2 **Common sizes** – wheel/tyres/ inner tubes: 26 inches, 700c and 20 inches

AC3.2 and AC 3.3 **Valves** - Schraeder, Presta, **repair patches** - various

Learning outcome

The learner will:

LO4 Be able to identify and use the appropriate tools and equipment to carry out the repair of a puncture on a rear wheel

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the **equipment** required to repair a puncture on a rear wheel.

Range

AC4.1 **Equipment** - tyre levers, spanner, puncture repair kit, pump

Learning outcome

The learner will:

LO5 Be able to carry out the repair of a puncture on a wheel

Assessment criteria

The learner can:

AC5.1Demonstrate how to carry out the repair of a puncture on a rear wheel
AC5.2 Demonstrate how to locate the puncture and identify the cause
AC5.3 Demonstrate undoing and tightening of fasteners associated with the repair of a puncture on a rear wheel
AC5.4 Explain how to recognise and report cosmetic damage to cycle components to the relevant person.

Unit 182 Remove and replace a cycle rim brake assembly

UAN:	Y/502/7322
Level:	Level 1
Credit:	2
GLH:	10
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to remove and replace a cable operated rim brake assembly.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when removing and replacing a cable operated rim brake assembly

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when working on a cable operated rim brake assembly

AC1.2 Demonstrate **Health and Safety workplace procedures** when working on a cable operated rim brake assembly

AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work minimising the risk of damage to the cycle, its systems, the environment, other people and their property when removing and replacing a cable operated rim brake assembly

AC1.5 Explain the importance or working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health and Safety workplace procedures** - follow manufacturer's instructions

Learning outcome

The learner will:

LO2 Be able to use relevant sources of information when removing and replacing a cable operated rim brake assembly

Assessment criteria

The learner can:

AC2.1 Ensure that records for cycle rim brake assembly are accurate
AC2.2 Follow correct **technical data** for removal, inspection and replacement of a rim brake assembly.

Range

AC2.2 **Technical data** - torque settings on all fasteners

Learning outcome

The learner will:

LO3 Know how rim brakes function

Assessment criteria

The learner can:

AC3.1 Identify the **components** which are relevant to a rim brake system
AC3.2 State the basic function of a brake

a. lever
b. inner and outer cable
c. calliper
d. block
e. calliper balancing screw
f. block wear indicator

Range

AC3.1 **Components** – housing, barrel adjusters, pinch bolts, wheel rim

Learning outcome

The learner will:

LO4 be able to identify and use the appropriate tools and equipment to remove and replace a cable operated rim brake assembly

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the **equipment** required to carry out the removal and replacement of a cable operated rim brake assembly.

Range

AC4.1 **Equipment** - cable cutters, spanner, hex keys, screw driver, crimp

Learning outcome

The learner will:

LO5 Be able to carry out the removal and replacement of a cable operated rim brake assembly

Assessment criteria

The learner can:

AC5.1 Demonstrate how to carry out the removal and replacement of a cable operated rim brake assembly
AC5.2 Demonstrate the **procedure** for setting up a cable operated rim brake
AC5.3 Explain how to recognise and report cosmetic damage to cycle components to the relevant person.

Range

AC5.2 **Procedure** - according to manufacturer's instructions

Unit 183 Remove and replace a cycle gear assembly

UAN:	D/502/7323
Level:	Level 1
Credit:	2
GLH:	10
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to remove and replace the front and rear gear assembly of a cycle.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when removing and replacing front and rear gear assembly

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when working on the removal and replacement of front and rear gear assembly

AC1.2 Demonstrate **Health and Safety workplace procedures** when removing and replacing front and rear gear assembly

AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work minimising the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health and Safety workplace procedures** - manufacturer's instruction

Learning outcome

The learner will:

LO2 Be able to use relevant sources of information when removing and replacing a front and rear gear assembly

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for removing and replacing a front and rear gear assembly are accurate
AC2.2 Follow correct **technical data** for removing and replacing a front and rear gear assembly.

Range

AC2.1 **Records** - job cards
AC2.2 **Technical data** – manufacturer's instructions

Learning outcome

The learner will:

LO3 Know how a front and rear gear assembly functions

Assessment criteria

The learner can:

AC3.1 Identify the **components** of a front and rear gear assembly
AC3.2 Identify the function of the
- a. H limit screw
- b. L limit screw
- c. b-tension adjuster
- d. barrel adjuster

AC3.3 Give examples of different **types of gear derailleur** and give their appropriate use
AC3.4 Give examples of different **types of gear shifters** and their appropriate use
AC3.5 Give examples of compatible components and non-compatible components.

Range

AC3.1 **Components** - H limit screw, L limit screw, b-tension adjuster, barrel adjuster, jockey wheels

AC3.3 **Types of gear derailleur** - long cage, short cage, medium cage, rear derailleur, front derailleur for double and triple chain ring assemblies

AC3.4 **Types of gear shifters** - thumb shifters, twist grip, trigger shifter

Learning outcome

The learner will:

LO4 Be able to identify and use the appropriate tools and equipment to carry out the removal and replacement of a front and rear gear assembly

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the **equipment** required to carry out the removal and replacement of a front and rear gear assembly

Range

AC4.1 **Equipment** - hex keys, spanner, chain-breaker, screw driver

Learning outcome

The learner will:

LO5 Be able to carry out the removal and replacement of a front and rear gear assembly

Assessment criteria

The learner can:

AC5.1 Demonstrate how to **carry out** the removal and replacement of a front and rear gear assembly

AC5.2 Demonstrate the **procedure** for setting up a front and rear gear assembly

AC5.3 Demonstrate the **procedure** for undoing and tightening common types of fasteners associated with the removal and replacement of front and rear gear assembly

AC5.4 Explain how to recognise and report cosmetic damage to cycle components to the relevant person

Range

AC5.1 **Carry out** - remove, install, limit and index
AC5.2 **Procedure for gear assembly** - manufacturer's instructions
AC5.3 **Procedure for undoing and tightening fasteners** - torque settings

Guidance

Remove and replace chain – front and rear derailleurs, index and limit.

Unit 184 Carry out a systematic cycle check

UAN:	H/502/7324
Level:	Level 1
Credit:	1
GLH:	6
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to carry out a systematic cycle check and basic adjustments.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely carrying out a systematic cycle check and basic adjustments

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when carrying out a systematic cycle check and basic adjustments

AC1.2 Demonstrate **Health and Safety workplace procedures** when carrying out a systematic cycle check and basic adjustments

AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work minimising the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health and Safety workplace procedures** – manufacturer's instructions

Learning outcome

The learner will:

LO2 Be able to use relevant sources of information when carrying out a systematic cycle check and basic adjustments

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for carrying out a systematic cycle check and basic adjustments are accurate
AC2.2 State the importance of following correct technical data for carrying out a systematic cycle check and basic adjustments.

Range

AC2.1 **Records** - pre-delivery inspection checklist

Learning outcome

The learner will:

LO3 Know how to carry out a systematic cycle check and basic adjustments

Assessment criteria

The learner can:

AC3.1 State the different **stages** of a systematic safety check.

Range

AC3.1 **Stages** - pre-delivery inspection checklist

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to carry out a systematic cycle check and basic adjustments

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use all the **equipment** required to carry out a systematic cycle check and **basic adjustments**.

Range

AC4.1 **Equipment** - spanners, hex keys, screw driver, torque wrench, pump, tyre pressure gauge
AC4.1 Basic adjustments - tyre pressures, adjust cable tension, barrel adjustments on brakes, pedals

---

Learning outcome

The learner will:

LO5 Be able to carry out a systematic cycle check and basic adjustments

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct procedure for carrying out a systematic cycle check
AC5.2 Decide whether the cycle is in a safe and roadworthy condition
AC5.3 Carry out basic adjustments required to leave the cycle in a safe and roadworthy condition
AC5.4 Recognise and report cosmetic damage to cycle components to the relevant person.

Unit 281 Remove and replace cycle tubular and tubeless tyres

UAN:	M/502/7326
Level:	2
Credit:	1
GLH:	6
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to remove and replace tubular and tubeless cycle tyres so that the cycle is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when removing and replacing tubular and tubeless tyres

Assessment criteria

The learner can:

AC1.1 Use appropriate **Personal Protective Equipment** and safety methods when removing and replacing tubular and tubeless cycle tyres

AC1.2 Demonstrate **Health & Safety workplace procedures** when removing and replacing cycle tyres

AC1.3 Describe and demonstrate workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work in a way which minimises the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.1 **Personal Protective Equipment** - compressor, gloves, goggles, apron
AC1.2 **Health & Safety workplace procedures** - manufacturer's instructions, ventilation

Learning outcome

The learner will:

LO2 Know how to locate and use relevant sources of information when removing and replacing tubular and tubeless cycle tyres

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for cycle tyres are accurate
AC2.2 State the importance of following correct technical data for removal and replacement of cycle tyres.

Range

AC2.1 **Records** - job cards

Learning outcome

The learner will:

LO3 Know how tubular and tubeless cycle tyres operate

Assessment criteria

The learner can:

AC3.1 State the function, **operation**, advantages and disadvantages of different tubular and tubeless cycle tyre systems

a. clinchers: sizes and types
b. tubular and tubular clinchers
c. tubeless.

Range

AC3.1 O**peration** - tread patterns, sizes, front and rear specific tread, directional, intended use

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to remove and replace tubular and tubeless cycle tyres

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the **equipment** required to remove and replace tubular and tubeless cycle tyres.

Range

AC4.1 **Equipment** - tyre levers, compressor, pump

Learning outcome

The learner will:

LO5 Be able to carry out the removal and replacement of tubular and tubeless cycle tyres

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct procedure for carrying out the removal and replacement of cycle tubular and tubeless tyres being worked upon
AC5.2 Demonstrate the basic examination and test methods carried out when removing and replacing tubular and tubeless cycle tyres
AC5.3 Recognise and report cosmetic damage to cycle components to the relevant person.
.

Unit 282 Remove and replace cycle braking systems

UAN:	H/502/7355
Level:	2
Credit:	2
GLH:	10
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to remove and replace cycle non standard braking systems so that the cycle is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when removing and replacing non standard braking systems

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when working on cycle non standard braking systems

AC1.2 Demonstrate the **Health & Safety workplace procedures** to follow when removing and replacing non standard braking systems

AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work minimising the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health & Safety workplace procedures** – manufacturer's instructions

Learning outcome

The learner will:

LO2 Know how to locate and use relevant sources of information when removing and replacing non standard braking systems

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for cycle non standard braking systems are accurate
AC2.2 State the importance of following correct technical data for removal and replacement of cycle non standard braking systems.

Range

AC2.1 **Records** - job cards

Learning outcome

The learner will:

LO3 Understand how cycle non standard braking systems operate

Assessment criteria

The learner can:

AC3.1 State the function, **operation**, advantages and disadvantages of different cycle non standard braking systems

a. rim brakes
b. disc brakes
c. hub brakes

Range

AC3.1 **Operation** - v-type, cantilever, dual pivot, u-type, cable operated, cable operated drum

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to remove and replace non standard braking systems

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the **equipment** required to carry out work on cycle non standard braking systems.

Range

AC4.1 **Equipment** - spanner, crimp, screw driver, hex keys, cable cutters

Learning outcome

The learner will:

LO5 Be able to carry out the removal and replacement of non standard braking systems

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct procedure for carrying out the removal and replacement of the cycle non standard braking systems being worked upon

AC5.2 Demonstrate the basic examination and test methods carried out when removing and replacing of cycle non standard braking systems

AC5.3 Recognise and report cosmetic damage to cycle components to the relevant person

Unit 283 Remove and replace cycle gear systems

UAN:	T/502/7327
Level:	2
Credit:	2
GLH:	10
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to remove and replace cycle gear systems so that the cycle is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when removing, repairing and replacing cycle gear systems

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when removing and replacing cycle gear systems
AC1.2 Demonstrate **Health & Safety workplace procedures** when removing and replacing cycle gear systems
AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials
AC1.4 Work minimising the risk of damage to the cycle, its systems, the environment, other people and their property
AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health & Safety workplace procedures** – manufacturer's instruction

Learning outcome

The learner will:

LO2 Be able to use relevant sources of information when removing and replacing cycle gear systems

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for cycle gear systems are accurate
AC2.2 State the importance of following correct **technical data** when removing and replacing cycle gear systems.

Range

AC2.1 **Records** - job cards
AC2.2 **Technical data** - manufacturer's instructions, torque settings

Learning outcome

The learner will:

LO3 Know how cycle gear systems function

Assessment criteria

The learner can:

AC3.1 State the function, operation, advantages and disadvantages of different cycle **gear systems**.

Range

AC3.1 **Gear systems** - mountain, road, hybrid

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to carry out the removal and replacement of cycle gear systems

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use all the **equipment** required to remove and replace cycle gear systems.

Range

AC4.1 **Equipment** - cassette/block removal tools, cable cutters, crimp, screw driver, hex keys, chain breaker, spanner, crank puller

---

Learning outcome

The learner will:

LO5 Be able to carry out the removal and replacement of cycle gear systems

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct **procedure** for carrying out the removal and replacement of the cycle gear systems being worked upon
AC5.2 Demonstrate the basic **examination and test methods** carried out when removing and replacing cycle gear systems
AC5.3 Recognise and report cosmetic damage to cycle components to the relevant person

---

Range

AC5.1 **Procedure** - remove chain, cable inners and outers, remove cassette, remove shifters/shift levers, remove chain rings

AC5.2 **Examination and test methods** - identify worn/damaged chains, sprockets, chain rings, jockey wheels, cranks, front and rear derailleurs, cables and housing

Unit 284 Remove and replace cycle hub bearings

UAN:	A/502/7328
Level:	2
Credit:	2
GLH:	10
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to remove and replace cycle hub bearings so that the cycle is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely remove and replace cycle hub bearings

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when removing and replacing cycle hub bearings

AC1.2 Demonstrate **Health & Safety workplace procedures** when removing and replacing cycle hub bearings

AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work minimising the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health & Safety workplace procedures** – manufacturer's instructions

Learning outcome

The learner will:

LO2 Know how to locate and use relevant sources of information when removing and replacing cycle hub bearings

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for cycle hub bearings are accurate
AC2.2 State the importance of following correct technical data when removing and replacing cycle hub bearings.

Range

AC2.1 **Records** - job cards

Learning outcome

The learner will:

LO3 Know how cycle hub bearings operate

Assessment criteria

The learner can:

AC3.1 State the function, operation, advantages and disadvantages of different **cycle hub** bearings
AC3.2 Explain the differences between removing cassettes, freewheels and fixed sprockets in order to service hubs

Range

AC3.1 **Cycle hub** - cup and cone bearing system, cartridge bearing systems, cassettes, freewheel and fixed

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to remove and replace cycle hub bearings

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the **equipment** required to remove and replace cycle hub bearings.

Range

AC4.1 **Equipment** - manufacturer specific bearing removal tools, cone spanners, freewheel/cassette remover, free-hub remover, hex keys, chain whip, lock ring tool

Learning outcome

The learner will:

LO5 Be able to carry out the removal and replacement of cycle hub bearings

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct procedure for carrying out the removal of cassettes, freewheels or fixed sprockets
AC5.2 Demonstrate the correct procedure for carrying out the removal and replacement of hub bearings
AC5.3 Demonstrate the **correct procedure** for carrying out the reinstallation of the cassettes, freewheels or fixed sprockets
AC5.4 Demonstrate the basic examination and test methods carried out on the rebuilt hub assembly
AC5.5 Recognise and report cosmetic damage to cycle components to the relevant person.

Range

AC5.3 **Correct procedure** - cup and cone and cartridge bearing

Unit 285 Remove and replace cycle bottom brackets and cranks

UAN:	J/502/7333
Level:	2
Credit:	2
GLH:	10
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to remove and replace bottom brackets and cranks so that the cycle is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when removing and installing cycle bottom brackets and cranks

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when removing and installing cycle bottom brackets and cranks

AC1.2 Demonstrate **Health & Safety workplace procedures** relating to removing and installing cycle bottom brackets and cranks

AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work minimising the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health & Safety workplace procedures** – manufacturer's instructions

Learning outcome

The learner will:

LO2 Know how to locate and use relevant sources of information when removing and installing cycle bottom brackets and cranks

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for cycle bottom brackets and cranks are accurate
AC2.2 State the importance of following correct **technical data** when removing and installing cycle bottom brackets and cranks.

Range

AC2.1 **Records** - job cards
AC 2.2 **Technical data** - torque settings, bottom bracket shell thread types

Learning outcome

The learner will:

LO3 Know how cycle bottom brackets and cranks function

Assessment criteria

The learner can:

AC3.1 State the function, operation, advantages and disadvantages of different **cycle bottom brackets and cranks**
AC3.2 Explain compatibility between different cycle bottom brackets and cranks
AC3.3 Explain the impact of chain line on performance

Range

AC3.1 **Cycle bottom brackets and cranks** - 3-piece, 1-piece, square taper, splined, outboard bearing

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to carry out the removal and installment of cycle bottom brackets and cranks

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the **equipment** required to remove and install cycle bottom brackets and cranks.

Range

AC4.1 **Equipment** - bottom bracket removal tools and crank extractors

Learning outcome

The learner will:

LO5 Be able to carry out the removal and installation of cycle bottom brackets and cranks

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct procedure for carrying out the removal and replacement of the **cycle bottom brackets** being worked upon
AC5.2 Demonstrate the correct procedure for carrying out the removal and replacement of the cycle cranks being worked upon
AC5.3 Demonstrate the basic examination and test methods on chain line
AC5.4 Recognise and report cosmetic damage to cycle components to the relevant person.

Range

AC5.1 **Cycle bottom brackets** - cup and axle, outboard bearing

Unit 286 Build a cycle wheel

UAN:	L/502/7334
Level:	2
Credit:	3
GLH:	14
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to build a cycle wheel so that the cycle is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when building a cycle wheel

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when lacing, tensioning and truing a cycle wheel

AC1.2 Demonstrate **Health & Safety workplace procedures** relating to wheel building

AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work in a way which minimises the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health & Safety workplace procedures** – manufacturer's instructions

Learning outcome

The learner will:

LO2 Know how to use relevant sources of information to build a cycle wheel

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for wheel building are accurate
AC2.2 State the importance of following correct **technical data** for wheel building
AC2.3 Collect data required to calculate correct spoke lengths for a wheel.

Range

AC2.1 **Records** - job cards
AC2.2 **Technical data** – manufacturer's instructions

Learning outcome

The learner will:

LO3 Know how cycle wheel components function

Assessment criteria

The learner can:

AC3.1 Name the main unit **components** and features of wheels
AC3.2 Identify
a. common spoke lacing patterns
b. leading and trailing spokes
c. inbound and outbound spokes.

Range

AC3.1 **Components** - rim, spokes, hub, nipples

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to build a cycle wheel

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the equipment required to measure, build and test a cycle wheel.

Range

AC4.1 **Equipment** - wheel jig, spoke key, dishing gauge, spoke tensionometer, spoke gauge

---

Learning outcome

The learner will:

LO5 Be able to carry out the lacing, truing and tensioning of a dished wheel

Assessment criteria

The learner can:

AC5.1 State how manufacturers' data can be used to select wheel components which are compatible with each other and suitable for the intended use of the wheel

AC5.2 Perform calculations (traditional or web-based methods) to determine correct spoke lengths for a dished wheel

AC5.3 Demonstrate lacing, tensioning and truing a minimum diameter of 26 inch (ERTO 559) dished wheel with three-cross pattern

AC5.4 Demonstrate spoke stress relieving techniques

AC5.5 Demonstrate technique which minimises spoke wind-up

AC5.6 Compare against recommended spoke tensions

AC5.7 Recognise and report cosmetic damage to wheel components to the relevant person.

Unit 287 Prepare frames and forks for cycle assembly

UAN:	H/502/7338
Level:	2
Credit:	1
GLH:	6
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to prepare frames and forks for cycle assembly so that the cycle is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when preparing frames, forks for cycle assembly

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when preparing frames and forks

AC1.2 Demonstrate **Health & Safety workplace procedures** when preparing frames and forks

AC1.3 Describe and demonstrate workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work minimising the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health & Safety workplace procedures** – manufacturer's instructions

Learning outcome

The learner will:

LO2 Be able to use relevant sources of information to prepare frames and forks for cycle assembly

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for frame and forks are accurate
AC2.2 State the importance of following correct **technical data** for frame and fork preparation.

Range

AC2.1 **Records** - job cards
AC2.2 **Technical data** – manufacturer's instructions

Learning outcome

The learner will:

LO3 Know how cycle frames and forks function

Assessment criteria

The learner can:

AC3.1 Describe the **components**, features and dimensions of frames and forks including
- a. Headtube dimensions
- b. Bottom bracket shell dimensions
- c. Steerer tube dimensions

AC3.2 Explain how to ensure the compatibility of frames and forks.

Range

AC3.1 **Components** - drop-outs and fork ends and seat tube dimensions

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to prepare frames and forks for cycle assembly

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use all the **equipment** required to prepare frames and forks ready for assembly.

Range

AC4.1 **Equipment** - facing tools, alignment tools, reaming tools, chasing tools

Learning outcome

The learner will:

LO5 Be able to carry out the preparation of frames and forks for cycle assembly

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct procedure for carrying out the preparation of frames and forks for cycle assembly

a. Facing and reaming
b. Thread clearing

AC5.2 Recognise and report cosmetic damage to cycle components to the relevant person.

Unit 288 Augment a cycle

UAN:	K/502/7339
Level:	2
Credit:	2
GLH:	10
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to fit accessories on a cycle so that it is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely fitting cycle accessories

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when fitting cycle accessories

AC1.2 Demonstrate **Health & Safety workplace procedures** relating to fitting cycle accessories

AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work in a way which minimises the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Range

AC1.2 **Health & Safety workplace procedures** – manufacturer's instructions

Learning outcome

The learner will:

LO2 Be able to use relevant sources of information when fitting cycle accessories

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for fitting all cycle accessories are accurate
AC2.2 State the importance of following correct **technical data** when fitting cycle accessories.

Range

AC2.1 **Records** - job cards
AC2.2 **Technical data** – manufacturer's instructions

Learning outcome

The learner will:

LO3 Know how cycle accessories function

Assessment criteria

The learner can:

AC3.1 State the function, operation, advantages and disadvantages of different cycle **accessories.**

Range

AC3.1 **Accessories** - mud guards, racks, lighting systems, bottle cages, child carriers, lock mounting

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to carry out the fitting of cycle accessories

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use all the equipment required to fit cycle accessories.

Learning outcome

The learner will:

LO5 Be able to carry out the fitting of cycle accessories

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct procedure for carrying out the fitting of the cycle accessory being worked upon

AC5.2 Recognise and report cosmetic damage to cycle components to the relevant person

AC5.3 Make adjustments to the cycle after fitting the accessories to ensure it is left in a safe and roadworthy condition.

Unit 289 Change a cycle frame

UAN:	T/502/7344
Level:	2
Credit:	2
GLH:	12
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to strip down and build a complete cycle so that it is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely stripping down and building a cycle

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when stripping down and building a cycle

AC1.2 Demonstrate Health & Safety workplace procedures relating to stripping down and building a cycle

AC1.3 Demonstrate and describe workplace and legislative procedures for handling, disposal and recycling of used and waste materials

AC1.4 Work in a way which minimises the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress

Learning outcome

The learner will:

LO2 Know how to locate and use relevant sources of information when stripping down and building a cycle

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for stripping down and building a cycle are accurate
AC2.2 State the importance of following correct **technical data** for stripping down and building a cycle

Range

AC2.1 **Records** - job cards
AC2.2 **Technical data** – manufacturer's instructions

Learning outcome

The learner will:

LO3 Understand how the cycle's systems operate

Assessment criteria

The learner can:

AC3.1 Identify the systems and components of a **cycle** and their functions.

Range

AC3.1 **Cycle** - front and rear derailleur system

Learning outcome

The learner will:

LO4 Know how to select and use the appropriate tools and equipment to strip down and build a cycle

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the equipment required to carry out cycle building.

Learning outcome

The learner will:

LO5 Be able to carry out a cycle frame change

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct procedure for stripping a cycle with a rigid frame and an index derailleur gear system, down to a bare frame and reassemble

AC5.2 Demonstrate the correct procedure when replacing brake and gear cables

AC5.3 Demonstrate the basic examination and test methods when stripping down and building a cycle

AC5.4 Recognise and report cosmetic damage to cycle components to the relevant person

AC5.5 Ensure the cycle is left in a safe and roadworthy condition

Unit 289 Change a cycle frame

Supporting information

Guidance

It is recommended that this unit be taken after achieving all other units at this level.

Unit 290 Service cycle headsets assemblies

UAN:	A/502/7345
Level:	2
Credit:	2
GLH:	10
Relationship to sector standards:	This unit is endorsed by SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies.
Aim:	The aim of this unit is to provide the learner with the skills and knowledge required to service cycle headset assemblies so it is left in a safe and roadworthy condition.

Learning outcome

The learner will:

LO1 Be able to work efficiently and safely when servicing cycle headset assemblies

Assessment criteria

The learner can:

AC1.1 Use appropriate Personal Protective Equipment and safety methods when servicing cycle headset assemblies

AC1.2 Demonstrate Health & Safety workplace procedures when servicing cycle headset assemblies

AC1.3 Demonstrate and describe workplace and legislative procedures for servicing cycle headset assemblies

AC1.4 Work in a way which minimises the risk of damage to the cycle, its systems, the environment, other people and their property

AC1.5 Explain the importance of working to agreed timescales and keeping others informed of progress.

Learning outcome

The learner will:

LO2 Know how to locate and use relevant sources of information when servicing cycle headset assemblies

Assessment criteria

The learner can:

AC2.1 Ensure that **records** for servicing cycle headset assemblies are accurate
AC2.2 State the importance of following correct **technical data** for servicing cycle headset assemblies.

Range

AC2.1 **Records** - job cards
AC2.2 **Technical data** – manufacturer's instructions

Learning outcome

The learner will:

LO3 Know how cycle headset assemblies operate

Assessment criteria

The learner can:

AC3.1 State the function, operation, advantages and disadvantages of different **headset assemblies**.

Range

AC3.1 **Headset assemblies** - threaded, threadless

Learning outcome

The learner will:

LO4 Be able to select and use the appropriate tools and equipment to service cycle headset assemblies

Assessment criteria

The learner can:

AC4.1 Demonstrate how to prepare and use the **equipment** required to service cycle headset assemblies.

Range

AC4.1 **Equipment** - headset spanners, hex keys, cup press, cup removal tool, crown race remover, crown race setting tool, star nut setter

---

Learning outcome

The learner will:

LO5 Be able to carry out the servicing of cycle headset assemblies

Assessment criteria

The learner can:

AC5.1 Demonstrate the correct procedure for dismantling a threaded headset assembly
AC5.2 Demonstrate the correct procedure for servicing a threaded headset assembly
AC5.3 Demonstrate the correct procedure for reassembling a threaded headset assembly
AC5.4 Demonstrate the correct procedure for dismantling a threadless headset assembly
AC5.5 Demonstrate the correct procedure for servicing a threadless headset assembly
AC5.6 Demonstrate the correct procedure for reassembling a threadless headset assembly
AC5.7 Recognise and report cosmetic damage to cycle components to the relevant person.

Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centre document library** on **www.cityandguilds.com** or click on the links below:

Centre Handbook: Quality Assurance Standards

This document is for all approved centres and provides guidance to support their delivery of our qualifications. It includes information on:

- centre quality assurance criteria and monitoring activities
- administration and assessment systems
- centre-facing support teams at City & Guilds/ILM
- centre quality assurance roles and responsibilities.

The Centre Handbook should be used to ensure compliance with the terms and conditions of the centre contract.

Centre Assessment: Quality Assurance Standards

This document sets out the minimum common quality assurance requirements for our regulated and non-regulated qualifications that feature centre-assessed components. Specific guidance will also be included in relevant qualification handbooks and/or assessment documentation.

It incorporates our expectations for centre internal quality assurance and the external quality assurance methods we use to ensure that assessment standards are met and upheld. It also details the range of sanctions that may be put in place when centres do not comply with our requirements or actions that will be taken to align centre marking/assessment to required standards. Additionally, it provides detailed guidance on the secure and valid administration of centre assessments.

Access arrangements: When and how applications need to be made to City & Guilds provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **Centre document library** also contains useful information on such things as:

- conducting examinations
- registering learners
- appeals and malpractice.

Useful contacts

Please visit the **Contact us** section of the City & Guilds website.

City & Guilds

For almost 150 years, we have worked with people, organisations and economies to help them identify and develop the skills they need to thrive. We understand the life-changing link between skills development, social mobility, prosperity and success. Everything we do is focused on developing and delivering high-quality training, qualifications, assessments and credentials that lead to jobs and meet the changing needs of industry.

We partner with our customers to deliver work-based learning programmes that build competency to support better prospects for people, organisations and wider society. We create flexible learning pathways that support lifelong employability because we believe that people deserve the opportunity to (re)train and (re)learn again and again – gaining new skills at every stage of life, regardless of where they start.

The City & Guilds community of brands includes Gen2, ILM, Intertrain, Kineo and The Oxford Group.

Copyright

The content of this document is, unless otherwise indicated, © City & Guilds Limited and may not be copied, reproduced or distributed without prior written consent. However, approved City & Guilds centres and learners studying for City & Guilds qualifications may photocopy this document free of charge and/or include a PDF version of it on centre intranets on the following conditions:

- centre staff may copy the material only for the purpose of teaching learners working towards a City & Guilds qualification, or for internal administration purposes
- learners may copy the material only for their own use when working towards a City & Guilds qualification.

The Standard Copying Conditions (see the City & Guilds website) also apply.

Contains public sector information licensed under the Open Government Licence v3.0.

City & Guilds reviews its qualifications on a regular basis to ensure they remain current, relevant, and meet industry and learner needs. This Qualification Handbook however may contain references to historic information, such as former organisations, obsolete frameworks, codes or standards, or retired units and qualifications. This information is included for reference purposes only.

Published by City & Guilds Limited, a company registered in England and Wales (company number 16513878).

City & Guilds Limited
Giltspur House
5–6 Giltspur Street
London
EC1A 9DE

cityandguildsgroup.com