Embedding Skills Competitions into Apprenticeships through the Apprenticeship Levy

How To Guide
Attending WorldSkills Abu Dhabi and the skills competitions at The Skills Show was an outstanding personal highlight for me during the last 12 months. To see the faces of the successful young competitors, their proud families and their tutors is a memory that will last for a very long time.

Many of the medal winners are apprentices and this should be no surprise. The strength of apprenticeships lies in the skills, knowledge and behaviours that employers want from young people. You will find them listed in this welcome new Guide from WorldSkills UK and when I meet employers, they always stress the enhancement of employability skills as a key reason for recruiting and training apprentices.

A successful apprentice in a skills competition is not just a matter of prestige; it brings tangible business benefits too. This is why the Association of Employment and Learning Providers (AELP) wants to see more employers and training providers support their apprentices in entering competitions. The Guide starts from first principles by explaining the organisational commitment required including identifying strategic objectives for the business and then maps out a pathway from internal competition to competing at higher levels, whether regionally, nationally or internationally. It also includes great tips on celebrating success which will encourage further buy-in.

Apprenticeships have been through a comprehensive and often challenging process of reform. The Guide has responded to this with really useful advice on matching a completion brief to a new standard. An invaluable read all round!

Mark Dawes,
Chief Executive, AELP
Skills competitions provide college students and staff with invaluable opportunities. Through participation in competitions, whether at a regional, national or international level, students develop not only their technical skills but also their soft skills in areas such as team working, entrepreneurship, and problem-solving. Engagement in skills competitions can help students to increase their confidence and enhance their employability prospects, providing employers with a talent pipeline from their local college.

Competitions can be embedded into the college curriculum, including apprenticeships, supporting student recruitment and retention, driving learning outcomes and helping staff to keep their industry knowledge up to date. Colleges up and down the country are involved in WorldSkills UK, and the Association of Colleges is keen to support more colleges and their local employer networks to become involved.

“Skills competitions are a great way to motivate colleges and students to strive for excellence and to improve the quality of learning. The coaching approach used to support competitors helps engage students in new ways which enhance the learning experience. That’s why the AoC is a strong supporter of and partner to WorldSkills UK”.

David Hughes,  
Chief Executive, Association of Colleges
“Having apprentices that have competed in skills competitions, increases their ability to understand the requirements and expectations of management, developing strong business acumen and the initiative to take action in the right moments. Naturally through competing in pressured conditions we see an improvement in productivity and quality of their work”

Pete Curtis, Labour Manager, Briggs & Forrester
WorldSkills UK is focused on improving the prestige of apprenticeships and technical education, to inspire more young people to consider these as career routes and get off to a better start in work and life. We do this through experiential careers advice, role modelling and engaging thousands of young people in skills competitions across the UK to the highest possible national standards. The best in the UK go into an accelerated development programme to compete with the best in the rest of the world.

Skills competitions provide a unique opportunity to give businesses a competitive advantage through adding value to apprenticeship programmes and leading to a stronger skills base. The new apprenticeship policies, especially the Levy and the move to standards with a greater focus on training and development, makes it an ideal time to consider engaging.

With the advent of the apprenticeship reforms and revised funding requirements, competitions can play an important role in enabling apprenticeship training providers and employers to:

- Develop a curriculum which meets apprenticeship standards
- Develop and test skills in preparation for End Point Assessment (EPA)
- Contribute to meeting the 20% off the job training requirement
- Provide stretch and challenge for apprentices
- Use competitions against the Apprenticeship Levy
The aim of this Guide is to encourage more apprenticeship training providers and employers to use skills competitions to improve the quality of their provision. It is a practical tool that can assist teams in designing and delivering competitions within apprenticeships.

It provides a step by step guide to establishing and embedding competitions and describes how funding can support these activities and what competitions mean for contracting with employers. It also outlines how this an meet Ofsted requirements. The appendices include some sample mapping of competitions with apprenticeship standards and some useful links.

We know from past experience that skills competitions help to drive up the quality of training. Designed to test the technical skills of learners, they are an excellent way of stretching both the skills of the apprentice and enhancing training practice. They can range from simple inclusive, classroom or workshop based competitions with a small group of learners to large scale set-piece events involving apprentices from a large number of employers and apprenticeship providers.

Competition activity provides a range of benefits to apprentices, apprenticeship training providers and employers. Table 1 highlights the benefits for each of those groups.

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**Background**

"The WorldSkills UK Competitions are a fantastic initiative that incentivises and rewards aspiring apprentices and trainees – the industry’s standard bearers and potential leaders of tomorrow – in pursuit of excellence."

David Dunn, Director, Toshiba
**Apprentice benefits**

- Dramatically boost skills, confidence and performance at work
- Raising level of technical skills
- Enhancing employability skills including:
  - Time management prioritisation
  - Pace
  - Networking and communication skills
  - Commitment and responsibility
  - Resilience
  - Problem-solving skills
  - Working to specific standards
- Contributing towards the completion of the apprenticeship standard
- Practising for EPA

**Apprenticeship training provider benefits**

- Competitions add value to the whole organisation by:
  - Increasing learners’ motivation, progression and achievement
  - Providing opportunities for presenting evidence for Ofsted inspections and self-assessment reports, including stretch and challenge
  - Contributing to the 20% off the job requirement
  - Preparing candidates for EPA
  - Enriching the offer to employers and showcase your apprenticeship training
  - Raising the profile of the organisation and your apprenticeship provision
  - Providing marketing and promotional opportunities
- To individual teachers and trainers by:
  - Enhancing teaching and training techniques
  - Increasing job satisfaction
  - Providing networking and CPD opportunities to learn from others

**Employer benefits**

- Boosting your business performance
- Teaching apprentices to work efficiently under pressure
- Increasing apprentices’ productivity eg by improving their time management
- Learners being more aware of leading-edge practice and more able to work to exacting standards
- Raising the profile and reputation of your business
- Supporting the 20% off the job requirement
How Do Skills Competitions Fit with Apprenticeships?

1. **Align with apprenticeship standards**
2. **Enrich the off the job training**
3. **Ideal preparation for EPA**

1. **Aligning with apprenticeship standards**

There are three ways to align skills competitions with your apprenticeships:

a) **Map an existing skills competition brief to the apprenticeship standard**

WorldSkills UK has produced a suite of skills competition briefs. There is significant alignment, in many cases, between the core competencies and standards listed within the competition briefs and the role requirements (skills, knowledge and behaviours) of an apprenticeship standard. Skills competitions also include many added value features that enrich the learner experience.

The competition briefs are a valuable resource for any apprenticeship training provider that is looking to offer engaging off the job training experiences that motivate apprentices. Originally intended for use at WorldSkills UK, they can be used by training providers/employers to help plan more local, bespoke competitions.

Straightforward to map:

As an example, we have taken two apprenticeship standards and mapped these against the skills competition briefs to demonstrate the alignment between the two. The areas we have chosen are:

<table>
<thead>
<tr>
<th>Apprenticeship Standard &amp; Level</th>
<th>Skills Competition Brief</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welding Level 3</td>
<td>Welding</td>
</tr>
<tr>
<td>Motor Vehicle Service and Maintenance Level 3</td>
<td>Automotive Technology</td>
</tr>
</tbody>
</table>

*Please see appendices on page 20.*

If you deliver different apprenticeship standards and want to see how current skills competition briefs align with these you will need to cross-reference the two documents (this task takes 30 minutes).

You will need to:

2. Download the skills competition brief that most closely matches the apprenticeship standard - visit [www.worldskillsuk.org/find-a-competition](http://www.worldskillsuk.org/find-a-competition)
b) Align with other existing local inter-organisational competitions or industry designed competitions:

- Explore if there are any existing competitions operating in your sector, either locally or nationally
- Examine the competition criteria and map the criteria across to the apprenticeship standard

c) Set up your own competition

Establishing a competition, either for your own apprentices or for apprentices across a range of training providers and employers, is achievable and brings with it significant benefits:

- Allows bespoke competition activity that aligns with your priorities and those of your employers and apprentices
- Encourages and supports networking and sharing of best practice across training providers and employers

WorldSkills UK has produced the following comprehensive guide that will enable you to set up your own exciting and meaningful skills competition which can be standalone or linked to WorldSkills UK and further into international competition.

[www.worldskillsuk.org/media/1065/wsuk_pre-competition_activity_toolkit_v4.pdf](http://www.worldskillsuk.org/media/1065/wsuk_pre-competition_activity_toolkit_v4.pdf)
The apprenticeship funding rules published in April 2017 for 2017-18 lists taking part in a skills competition as an eligible cost. The funding rules also state that attending competitions can count towards the apprentice’s off the job training, which must make up a total of 20% of the apprentice’s working hours.

**Getting started:**

1. Identify whether there is a skills competition that aligns with the apprenticeship standard being delivered

2. Apprenticeship training providers and employers need to have early discussions on how skills competitions can be integrated with and complement apprenticeship delivery. Proposals should be closely aligned to employers’ business needs and include identified, well-defined benefits

3. Agreements between employers and training providers should clearly identify the commitment and resources needed to support competition activity, which is explained in more detail in the following section on Funding and Eligible Activity

4. Cross-reference the training to be delivered with the competition criteria (eg skills competition briefs, local inter-provider competitions or industry designed tests)

5. Apprenticeship training providers and employers identify how to include competitions within an individual learning plan. This could be inclusion into a single lesson, periodically or throughout the curriculum

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3. **Ideal preparation for EPA**

The process of the competition activity can contribute to the actual EPA, in part or in full. There are some challenges with this approach:

- Competitions may not always align with the requirements of the Apprenticeship Assessment Organisation (AAO)
- Pressure on the apprentice may be too great

Skills competitions can support your apprentices in preparing for the EPA and achievement of the apprenticeship standards. Successful participation in a competition aligned to an apprenticeship standard is a really good method of preparing candidates for EPA as it:

- Provides your apprentices the opportunity to benchmark their skills against the requirements of the apprenticeship standard prior to being put forward for EPA
- Encourages your apprentices to strive for a higher level of competence than they may require in order to achieve their apprenticeship
- Gives your apprentices experience of using their skills in highly pressurised, time-dependent environments

It is the employer’s responsibility to select an AAO from those listed on the register of apprentice assessment organisations. The AAO will need early engagement with the employer and you, the apprenticeship training provider to confirm the detail and logistics of the EPA service they will offer.

It is important at this early stage for the employer, the AAO and the apprenticeship training provider to discuss how the competition activity can be included and aligned to the EPA process.

Factors that the apprenticeship training provider, employer and AAO need to consider at this point include:

1. Is there a competition brief already in existence?
2. Does this align with the AAO assessment criteria?
3. Can the competition environment replicate the EPA environment, in terms of location, conditions and time allocated?
4. Who is going to assess the competition activity?
5. What are the resource implications and how will these be met?
6. How is the competition activity to be recorded as evidence?
7. How are the results from the competition going to be used to inform:
   - a) Where the apprentice needs to improve their practice?
   - b) What steps the training provider/employer need to take to enable the improvement to take place?
This section is aimed at supporting apprenticeship training providers and employers to initiate competition activity. We have identified a five stage process that is intended to act as a step by step guide from the initial consideration through to running competitions.

1. Finding out
2. First steps
3. Running and reviewing competitions
4. Reflection
5. Celebration
1. Finding out

When developing competition activity it makes sense to look at what is already happening in your sector’s local area and what other apprenticeship providers and employers are already doing. We know that in some sectors, for example hair and beauty, there is a track record of competition activity. Finding out what others are doing is an excellent starting point. This will help staff understand what the successful organisation of competition activity entails, including the likely staff time and other resources required. For example:

- Visit other providers and employers who are engaged with competition activity to identify aspects that could be incorporated into your strategy
- Identify whether any existing competition is taking place within your teaching and learning and if so, bring this activity together as a starting point for developing a competition strategy
- Consider a skills competition ‘champion’ in your senior leadership team and teachers, trainers and staff to form a task group to organise the detail of competition activity.

2. First steps

A critical first step is to ensure that you have clear aims and objectives for your competition strategy and that the staff involved understand what you aim to achieve. When developing your plans an initial checklist might include:

- How the activity will enhance and add value to your apprenticeship training to benefit both your apprentices and their employers
- How it aligns to specific objectives in your business, self-assessment and quality improvement plans
- Engaging employers in supporting your competition strategy by encouraging apprentices to participate, providing facilities, sponsorship or acting as judges
- Identifying how competition activity will help to stretch and challenge the skills of apprentices
- Introducing a phased approach by focusing in on a particular framework, standard, a particular cohort of learners or where a member of staff is passionate about competitions
- Identifying whether colleagues have been involved in competition activity in the past and are keen to act as a champion
- Understanding how your systems and processes will need to be refined in order to ensure competition activity is eligible for funding and how to capture the necessary evidence
- Considering the amount of staff time and other associated costs and how these will be met
- Aligning staff development to your competition strategy

An essential prerequisite is to explain to both learners and employers the learning benefits which can be gained from participating in competition activities and to establish clear learning objectives for participants and to explain these to employers.
3. Running and Reviewing Competitions

Once you have completed your initial research and planning it is time to deliver your first skills competitions. There are already some excellent resources which offer guidance to providers and employers on developing initial competition activity.

The WorldSkills UK website and accompanying toolkit can be found via the following link.

www.worldskillsuk.org/run-your-own-skills-competition

Following pilot competition activity a comprehensive review should take place identifying good practice, issues and lessons learned. The review should involve participants, staff and employers and should include

- Initial marketing activity
- Recruitment of participants
- Preparing and supporting apprentices, including pre-competition briefings and materials
- The arrangements and activities on the day
- What benefits apprentices have gained
- Suggestions for improvements

In the longer term you should also consider:

- How is it enhancing apprenticeship delivery?
- How is it actually stretching and challenging apprentices?

One thing that should always be considered is whether you have apprentices with the potential to go further and to consider participation in WorldSkills UK Competitions. The following website provides information on how to participate.

www.worldskillsuk.org/competitions
4. Reflection
Once you have successfully undertaken and reviewed your initial competition activity you may wish to reflect on how your approach is embedded within your organisation. In developing your model further you could consider:

- Additional curriculum/skill areas which should be targeted in the next phase
- Introducing benchmarks for measuring progress
- Aligning internal competitions with local, regional and national competition cycles
- Listing competition activity as a standing agenda item at board and SMT meetings
- Identifying a board member or senior staff member to have a responsibility for competitions
- Identifying skills champions across all vocational areas
- Increasing employer engagement in skills competitions
- Encouraging staff to become trainers, mentors and judges
- Creating an organisation identity for apprentices involved in external competitions for example, branded polo shirts

5. Celebration
Competitions provide an excellent opportunity to showcase apprenticeship training. Providers might consider inviting employers, other apprentices, other staff, and other providers to witness your competition activity. Employers might share successes across the wider team. You should also highlight successes in both internal and external competitions to a wider audience.

- Utilise competitions as a marketing tool using: websites and other collateral that promotes your organisation’s competition successes; press releases to your trade sector and local media; share stories with your networks through social media
- Celebrate both participation and success in external competitions including sector-based competitions, employer sponsored competitions and WorldSkills UK Competitions
- Celebrate staff involvement and staff development
- Highlight successes to your employers in order to gain further buy-in
- Create case studies of learners, staff and employers engaging in competition
- Integrate competition success into awards and awards ceremonies
- Work in partnership with your employers and other organisations participating in competitions to share messages of success
**Funding and Eligible Activity**

**Funding checklist**

Providers should consider the following key dimensions when devising their approach to funding apprenticeship-related competition activity:

- The competition activity directly contributes to the achievement of the apprenticeship
- You have referenced competitions in schemes of work and curriculum plans
- You have included competitions in employer agreements
- The associated activities are eligible
- You have recorded the evidence

The apprenticeship funding and performance management – rules for apprenticeship training providers (May 2017 to March 2018) make specific reference to competitions:

**i. What can be funded?**

The funding guidance states that funds from an employer’s digital account, government-employer co-investment and the transitional funds paid for 16-18 year olds on framework must be used for activity related to the apprenticeship but can include:

- Costs of an apprentice taking part in a skills competition if the employer and provider have agreed that participation in the competition directly contributes to helping that individual achieve the apprenticeship standard.

**ii. Recommended approach**

When engaging employers in planning for apprenticeship recruitment we would recommend including the potential for apprentices to take part in competitions at the earliest opportunity. This will help to ensure that when agreeing funding rates with employers that provision is made to support competition activity. This can either be from a levy-payer’s digital account or the SME non levy-funding contract.

**iii. Eligible activity**

By considering the funding guidance the types of activity which if they can be evidenced that they directly contribute to the apprenticeship and would be eligible include:

- Staff costs associated with developing, organising and delivering competition activity
- Payment to a third party organisation if they host and charge for the competition activity
- Development of distance learning or online materials if the competition is ‘virtual’
- Materials used in the competition or in preparation/practising for the competition
- Administration of the competition
- Accommodation costs associated with the competition
iv. Contributing to off the job training

In addition to contributing to the overall apprenticeship framework or standard, participation might also contribute to the 20% off the job element and is eligible activity in this respect:

P31 defines off the job training as learning which is undertaken outside of the normal day-to-day working environment and leads towards the achievement of an apprenticeship. This can include training that is delivered at the apprentice’s normal place of work.

P32 specifically states that off the job training must be directly relevant to the apprenticeship framework or standard and could include:

- Practical training; shadowing; mentoring; industry visits and attendance at competitions

v. Approaches to funding

There are several options when organising, funding and pricing of competition activity which providers might adopt. The three main options are:

i. Entering apprentices into existing WorldSkills UK Competitions or other existing/planned competition activity

If organising your own competition:

ii. Single Employer Option – A provider and employer with multiple apprentices determines that participation by some /or all apprentices forms part of a scheme of work for the delivery of the apprenticeship framework or standard

iii. Multiple Employer Option – A provider organises a competition which is open to apprentices across a range of employers and may involve only one or more apprentices within an individual employer

Providers might also consider the potential for employer contributions which might include hosting the event, providing facilities, equipment, materials, or sponsoring a competition.

vi. Funding and pricing

There are a range of options when considering how to fund the activity. These are:

• Within the funding cap:

  o Standard pricing model – include the costs of the competition in the provider’s overall charging/pricing policy spreading the cost across all employers/apprentices

  o Variable pricing model – the provider calculates the cost of the competition and the anticipated volume of participants and applies this charge for each participant on a standard scale as an enrichment activity

  o Individual pricing model – charged as an additional cost to the employer for the participation of an individual

• Where the funding cap is exceeded:

  o Employer additional pricing model – in circumstances where the funding cap is exceeded or for existing apprentices where prices have already been agreed it can be charged to the employer as an additional cost

An alternative approach might be to meet the competition costs from previous surpluses or from other funding sources which may potentially include employer(s) sponsorship.
vii. **Evidencing eligible activity and meeting audit requirements**

In order to utilise apprenticeship funding for competition activity from large Levy payers, non-Levy paying ESFA contract funding, mandatory employer contributions or additional employer contributions for audit purposes. They should consider:

- Their existing processes and contract documentation
- The types of evidence they should gather to demonstrate eligibility
- The recording and retention of evidence

**Contracting with employers**

The apprenticeship funding and performance–management rules require that providers must have a contract for services in place with employers for whom they are delivering apprenticeship training and a signed commitment statement for each apprentice.

Providers should consider:

- Including the potential opportunity for apprentices and their employers to engage in competitions as an option as part of the schedule of activity which is set out in the contract for services
- Including the potential opportunity to participate in competitions with commitment statements

**Schemes of work and course materials**

Providers are recommended to make reference to the potential for use of competitions when:

- Developing employer and learner-facing marketing materials including apprenticeship course guides and promotional flyers
- Mapping standards and developing curriculum plans
- Producing detailed schemes of work
- Outlining their enrichment activities and options to employers and apprentices

**Learner materials**

Where individuals have been involved in preparing for and participating in competitions this should be included as part of:

- Individual learning plans
- Individual learning logs/activity logs and portfolios either paper-based or electronic
- Learner reviews/progress reviews between the apprenticeship training providers and employer, and recorded as such
**Contributing to Ofsted Requirements**

Skills competitions demonstrate to Ofsted how apprenticeship providers are meeting the common inspection framework standards by using competition activity to deliver high quality training. Providers and employers could view and present them as a means of developing high expectations and the highest level of technical and vocational skills. Competitions provide opportunities for learners to gain additional skills and experiences which could form a useful focus for value added conversations and exemplify differentiation in practice.

Skills competition activity can be used to monitor progress of learners throughout their apprenticeship programme.

The Associations of Colleges (AoC) delivered a skills competition CPD Programme. As part of the programme they produced a table that mapped Ofsted evaluation criteria and guidance against contributions from competition and coaching. The table can be found here:

[www.aoc.co.uk/sites/default/files/Ofsted%20outcomes.pdf](http://www.aoc.co.uk/sites/default/files/Ofsted%20outcomes.pdf)
Appendices

Welding Competition Guidelines
Core competencies and standards for WorldSkills UK Skills
Competitions activity in Welding

Working environment – knowledge and understanding:
- Comprehend and comply with the standards and laws relating to safety, security and hygiene in the welding and construction industry
- Describe the various items of personal protective equipment required for any given situation
- Describe the precautions for the safe use of power tools
- Describe the possibilities for sustainability in the welding and construction industry

Working environment – competitors shall be able to:
- Become familiar with the UK’s Health and Safety Regulations documentation
- Display the safe and proper use of all equipment used in the welding and construction industry
- Identify and use the appropriate personal protective equipment
- Separate trash and different metals for recycling
- Work carefully within their work/competition environment

Welding – knowledge and understanding:
- Describe the various welding processes commonly used in industry
- Describe the techniques available for the joining of materials by welding
- Understand basic welding metallurgy
- Describe various methods for testing welds and welders

Welding – competitors shall be able to:
- Read and interpret drawings and specifications
- Set-up welding equipment in accordance with the manufacturers’ specifications
- Select the required welding process as nominated on the drawings
- Set and adjust welding parameters as required, including (but not limited to):
  - Welding polarity
  - Welding amperage
  - Welding voltage
  - Wire feed speed
  - Travel speed
  - Torch/electrode angles
  - Mode of metal transfer
- Maintain welding equipment to deliver required results
- Perform welding in all positions on plate and pipe for all nominated processes as detailed in ISO2553 and AWS A3.0/A2.4
- Weld steel plate and sections utilising the Manual Metal Arc Welding process (111)
- Weld steel plate and sections utilising the Gas Metal Arc Welding process (135)
- Weld steel plate and sections utilising the Flux Cored Arc Welding process (136)
- Weld stainless steel sheet and sections utilising the Gas Tungsten Arc Welding process (141)
- Weld aluminium sheet and sections utilising the Gas Tungsten Arc Welding process (141)
- Clean welds utilising wire brushes, chisels, scrapers, etc

Welding Apprenticeship Standard
Role requirements (skills, knowledge and behaviours) for Apprenticeship standard in Welding – Level 3

• Intervention, to challenge poor practices and channel feedback to the appropriate authorities to implement change
• Ensure that health and safety requirements are fully accounted for in all the above
• Understand and identify hazards and health, safety and quality requirements when welding
• A questioning attitude, to understand the processes and associated industrial applications. Maintaining competence with a commitment to continuing professional development planning and preparation to ensure safety, quality and production and goals are achieved
• Understand and identify hazards and health, safety and quality requirements when welding
• Understand different types/functions of welding consumables and requirements for correct storage, handling and recycling
• Prepare, check and protect materials and work area ready for welding

• Understand the common arc welding processes, joint types (fillet, full penetration and part penetration butt, branches, sockets, etc) and welding positions
• Understand the major components of welding equipment, ancillary equipment and the essential parameters for welding
• Understand the fundamentals of welding metallurgy (weld solidification and heat affected zone)

• Know how to interpret and work to a welding procedure specification
• Position, assemble, prepare and check the welding equipment

• Produce good quality welds in pipe and/or plate using three welding process/material type combinations (TIG, PAW, MMA, MIG/MAG, FCAW) and (Carbon and Low Alloy Steel, High Alloy Ferritic/Martensitic Steel, Austenitic Stainless Steel, Nickel and Nickel Alloys, Aluminium and Aluminium Alloys) covering all welding positions (Downhand, Horizontal, Vertical, Overhead, Inclined)

• Attain a qualification in accordance with one of the following standards: ISO 9606 / ASME IX / AWS D1.1, determined by the employer. NB these are regarded as licences to practice in welding
• Achieve a quality of work to meet international standards for dimensional, surface inspection (Visual, Magnetic Particle and Dye Penetrant Inspection) and volumetric inspection (Radiography, Ultrasonics)
Materials – knowledge and understanding:
• Describe the mechanical and chemical properties of steel
• Describe the mechanical and chemical properties of stainless steel
• Describe the mechanical and chemical properties of aluminium
• Describe the properties and classification of welding consumables

Materials – competitors shall be able to:
• Work with the different materials as mentioned above with consideration of the different mechanical and chemical properties. Specific material types include (but are not limited to):
  o Carbon steel
  o 300 series austenitic stainless steel
  o 5000 and 6000 series aluminium
• Check material against supplied test project material lists
• Select the appropriate filler material type and size for the selected welding process and joint configuration
• Prepare materials for welding
• Handle/store materials in a manner that will prevent contamination
• Handle/store consumables in a manner that will prevent contamination

Automotive Technology Competition
Guidelines Core competencies and standards for WorldSkills UK Skills Competitions Activity in Automotive Technology

Automotive Technology Apprenticeship Standard Role Requirements (Skills, Knowledge and Behaviours) for Apprenticeship Standard in Motor Vehicle Service and Maintenance Technician (Light Vehicle) – Level 3

Work organisation and management – knowledge and understanding:
• The purpose, use, care and maintenance of all tools and equipment together with their implications on safety
• The purpose, use, care and potential risks associated with materials and chemicals
• The risks associated with required activities and how to prevent or minimise them
• The time available for each task and overall competition
• The health and safety standards which apply
• Environmental and safety principles applied to good housekeeping in the workplace

Work organisation and management – competitors shall be able to:
• Prepare and maintain a safe, tidy and efficient work area
• Plan prepare and complete each task in the time allocated
• Select and use all equipment safely and in compliance with manufacturers’ instructions and health and safety standards
• Identify and use the appropriate personal protective equipment
• work safely within their work/competition environment
• restore the work area and vehicle to an appropriate state and condition

• Be aware of physical and mechanical properties (strength, toughness, corrosion resistance, etc) and weldability of welded materials
• Be able to identify and select correct welding consumables for each application

• Produce good quality welds in pipe and/or plate using three welding process/material type combinations (TIG, PAW, MMA, MIG/MAG, FCAW) and (Carbon and Low Alloy Steel, High Alloy Ferritic/Martensitic Steel, Austenitic Stainless Steel, Nickel and Nickel Alloys, Aluminium and Aluminium Alloys) covering all welding positions (Downhand, Horizontal, Vertical, Overhead, Inclined)
• Prepare, check and protect materials and work area ready for welding
• Receive, handle and maintain consumables
• Appreciate the requirements for correct storage, handling and segregation of materials and tooling to prevent cross contamination between sensitive materials

• Contribute to the maintenance of a safe and efficient workshop and adhere to the dealership/garage’s business processes (eg environmental awareness, servicing a vehicle, record-keeping, customer contact) and standard workshop operations
**Communication and interpersonal skills – knowledge and understanding of:**
- The range and purpose of documentation including written, technical drawings and wiring diagrams both on paper and held electronically
- The technical language associated with automotive skills
- The standards required for routine and exception reporting in oral, written and electronic formats
- The nature of reports provided by measuring equipment and their interpretation
- The required standards for customer care

**Communication and interpersonal skills – competitors shall be able to:**
- Read and interpret technical data from workshop manuals in any available format
- Communicate in the workplace by written and oral means, using standard formats
- Communicate in the workplace by oral, written and electronic means to ensure clarity, effectiveness and efficiency
- Use a standard range of communication technologies
- Complete reports and respond to issues and questions arising
- Respond to customer needs

**Vehicle electrical and mechanical systems – knowledge and understanding of principles and characteristics of:**
- Spark ignition engine management systems.
- Compression ignition engine management systems
- Forced induction, emission and exhaust systems
- Body electrical and electronic systems
- Braking and stability control systems
- Suspension and steering systems
- Drive line and transmission systems
- HVAC systems
- Air bag and safety restraint systems (SRS)
- The relationship and interdependency between each system and the effects this can cause
- Sensors and how they are shared between various management systems

**Vehicle electrical and mechanical systems – competitors shall be able to:**
- Use test equipment to measure, check and diagnose management systems for electrical/electronic and mechanical faults
- Perform tests to identify, confirm and isolate a fault

**Inspection and diagnosis – knowledge and understanding:**
- The correct use and interpretation of relevant measuring devices and equipment
- The principles and applications of all relevant numerical and mathematical calculations
- The principles and application of advanced diagnostic procedures
- The principles and application of specialist diagnostic tools and equipment

**Vehicle electrical and mechanical systems – competitors shall be able to:**
- The fundamentals of vehicle technologies eg vehicle systems such as chassis, engine, transmission, electrical, air conditioning, high voltage vehicles, etc
- The types, and associated characteristics, of light vehicles eg front- or rear-wheel drive, four-wheel drive, etc
- Inspect and prepare a vehicle to the required quality standard for handover to the customer eg following a service, complex repair, pre-delivery inspection etc
- Service and maintain a vehicle without supervision
- Remove repair/replace components in line with manufacturers’ standards

**Investigate symptoms of vehicle fault(s) and identify the likely underlying causes**
- Apply advanced diagnostic principles and logical problem-solving techniques, supported by diagnostic tools and testing regimes, to establish electrical, mechanical and electronic faults
- Use current flow diagrams and electrical test equipment to carry out standard diagnostic and repair procedures
- Diagnostic principles and logical problem-solving techniques
Inspection and diagnosis – competitors shall be able to:
• Calibrate and use all measuring devices and equipment (mechanical, electrical and electronic) for diagnostic fault-finding
• Determine the exact location of component faults in a range of light vehicle systems
• Select and apply the appropriate devices and equipment to make inspections and diagnose deficiencies and faults in:
  o Spark Ignition systems
  o Compression ignition systems
  o Forced induction, emission and exhaust systems
  o Body electrical and electronic systems
  o Braking and stability control systems
  o Suspension and steering systems
  o Drive line and transmission systems
• Make calculations check and interpret results as required
• Review the options for repair or replacement

Repair, overhaul and service – knowledge and understanding:
• The options for repair or replacement
• Repair methods and procedures
• Special tool requirements
• Effects on other vehicle systems and associated repair work of their actions

Repair, overhaul and service – competitors shall be able to:
• Use manufacturers’ and component suppliers’ specifications as required
• Construct, justify and communicate appropriate proposals and decisions regarding repair or replacement
• Use correct procedures for securing replacement parts
• Repair vehicle electrical systems and circuits including charging and starting systems
• Repair/overhaul hydraulic braking systems and associated components, including parking brakes (manual and electronic)
• Repair electronically controlled antilock braking systems and stability control systems
• Remove and overhaul drive train components
• Remove and overhaul steering system components including mechanical, electrical and hydraulic power assisted steering components
• Remove and replace suspension system and associated components
• Carry out steering alignment/geometry checks and adjustments
• Repair/overhaul four stroke engines and associated engine components
• Repair/overhaul manual/automatic transmissions/transaxles and components
• Repair fuel systems (petrol and diesel) including electronic engine management systems and associated components

Inspection and diagnosis – knowledge and understanding:
• Special procedures for working on high voltage vehicles
• Principles of operation for hybrid/electric and alternative powered vehicles
• Consumer electronics eg infotainment systems, Sat Nav, etc

Inspection and diagnosis – competitors shall be able to:
• Carry out service repair and diagnostic procedures according to manufacturers’ specifications

• Use diagnostic, mechanical and electrical measuring equipment
• Apply advanced diagnostic principles and logical problem-solving techniques, supported by diagnostic tools and testing regimes, to establish electrical, mechanical and electronic faults
• Use diagnostic, mechanical and electrical measuring equipment
• The fundamentals of vehicle technologies eg vehicle systems such as chassis, engine, transmission, electrical, air conditioning, high voltage vehicles, etc.
• The types, and associated characteristics, of light vehicles eg front- or rear-wheel drive, four-wheel drive, etc
• Inspect and prepare a vehicle to the required quality standard for handover to the customer eg following a service, complex repair, pre-delivery inspection etc
• Service and maintain a vehicle without supervision
• Remove repair/replace components in line with manufacturers’ standards

• Use current flow diagrams and electrical test equipment to carry out standard diagnostic and repair procedures
• Remove repair/replace components in line with manufacturers’ standards
• Inspect and prepare a vehicle to the required quality standard for handover to the customer eg following a service, complex repair, pre-delivery inspection etc
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• Apply advanced diagnostic principles and logical problem-solving techniques, supported by diagnostic tools and testing regimes, to establish electrical, mechanical and electronic faults
• Use current flow diagrams and electrical test equipment to carry out standard diagnostic and repair procedures
Useful links

*Adding value to apprenticeships with skills competitions activity – for providers*
www.worldskillsuk.org/media/4325/wsuk-information-note-apprenticeship-providers.pdf

*Adding value to apprenticeships with skills competitions activity – for employers*
www.worldskillsuk.org/media/4326/wsuk-information-note-employer.pdf

*Apprenticeship funding guidance*
If you need any further help or assistance please contact us:

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W: www.worldskillsuk.org
✓ Instagram: WorldSkillsUK