WorldSkills UK
Web Development

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Web Developer

"A Web Developer is a programmer who builds websites and web applications that run on the internet. They focus on ensuring a website works smoothly by writing code that connects the web server to your browser, often using languages like HTML, CSS, JavaScript, PHP, and SQL. Web development is typically divided into two areas: front-end and back-end. Front-end developers work on the parts of a website that users see and interact with, such as layout, buttons, and navigation, while back-end developers handle the behind-the-scenes processes, like databases, servers, and application logic. While Web Designers focus on how a website looks, Web Developers handle the technical side to ensure everything functions properly.

Some web developers also have design skills, allowing them to work on both the appearance and functionality of a website."

Web Developers apply their technical expertise to craft and maintain websites and web applications, leveraging their skills in coding, problem-solving, and design. Beyond just writing code, they handle tasks like creating user-friendly interfaces, managing databases, and ensuring smooth functionality. In this rapidly changing field, adaptability is key, as developers must keep up with evolving technologies and practices. A vital part of their work is ensuring websites and applications are accessible to all users, regardless of their device or location, making inclusivity and responsiveness central to their skills set.

COMPETITION OVERVIEW

During the **WorldSkills UK - Web Development** competition, participants will receive a brief to work throughout the three competition stages. The competition includes a range of competencies for web designers and developers.

The competition journey will take you through the following steps outlined below:

Registration

Once you have completed your registration (and accepted all terms and conditions) you will be emailed a link for the entry stage with an initial online assessment.

STAGE 1: Entry Stage

When the entry stage has been completed, you will be notified to let you know if you have scored high enough (over 70%) to go through to the national qualifiers (the semi-final round). You will then be informed when and how the National Qualifiers will take place.

STAGE 2: National Qualifiers

The 2025 National Qualifiers are set to take place online, offering participants a dynamic three-hour challenge. This year's evaluation will spotlight coding expertise, with a strong emphasis on showcasing skills in the *Design Implementation* aspect. While the use of HTML, CSS, and JavaScript will be assessed, the incorporation of frontend frameworks such as React, Vue.js, Vite along with Bootstrap or Tailwind is permitted but not mandatory.

Ensure you're ready to compete in the national qualifiers by looking at the online training resources, core competencies and marking guidelines below. This handbook outlines the type of tasks you will be expected to carry out. Ask your lecturer/employer for help in any areas where you feel you could improve, and try to gain practical experience in all the task areas of the competition.

STAGE 3: WorldSkills UK National Finals

The **8 highest scoring competitors** across all the National Qualifiers will be invited to compete at the finals in a venue, details of which will be confirmed at a later time.

Make sure you're prepared for the UK's National Finals by reviewing the essential skills and marking criteria provided below. These guidelines will give you an idea of the competencies you are expected to demonstrate. If there are areas you think you need to enhance, seek assistance from your lecturer or employer. Additionally, aim to acquire hands-on experience in every task area of the competition.

STAGE 4: International Competitions

After the National Finals, competitors can explore numerous other opportunities. Those who are of the appropriate age and demonstrate exceptional skill, passion, and determination in the national finals will have the chance to train for and compete in the EuroSkills (https://worldskillseurope.org) and WorldSkills (https://worldskills.org) international competitions.

For those who do not meet the criteria for international competition, the Skills Champions programme offers an alternative path for continued participation. This programme provides opportunities to collaborate with WorldSkills UK and engage with schools, colleges, and various events to motivate future generations.

Moreover, if you are interested in training, you might consider assisting WorldSkills UK in planning, training activities, and even contributing to the success of future National Finals.

Web development offers a diverse range of career paths, each with its own set of specialised skills and roles that cater to different aspects of creating and managing websites and applications. From the artistic and functional designs crafted by Web Designers, who prioritise user experience and aesthetic appeal, to Front-End Developers who bring these designs to life through code, ensuring seamless interaction and responsive design across devices. Back-End Developers focus on the server-side, handling database management, API

integration, and security compliance, which are essential for the functionality and reliability of web applications.

Full Stack Developers bridge the gap between front-end and back-end development, bringing a wide-ranging skill set that spans the entire web development process. Their ability to work on both the user-facing and server-side aspects of web applications makes them highly versatile and valuable members of any development team. This role requires proficiency in various technologies, including programming languages like JavaScript and PHP, frameworks such as React, Node.js, and Laravel, and tools for managing databases, APIs, and server configurations. Their comprehensive knowledge allows them to oversee and contribute to every stage of a web application's development, from design to deployment.

As digital needs grow and transform, so do the roles of web developers, who continuously evolve to meet the demands of an industry that sits at the heart of the modern world's digital experience.

WEB DESIGNER

Key Skills

Design Principles	★★★★★
User Experience (UX)	★★★★
User Interface (UI)	★★★★
Graphic Design	★★★
Coding	★

Key Technologies

Design Tools: Figma, Adobe Creative Suite (Photoshop, Illustrator, XD), Sketch
Prototyping Tools: InVision, Adobe XD, Axure
Front-End Basics: HTML, CSS (Understanding)
Content Management Systems: WordPress, Joomla, Drupal (Familiarity)
Version Control: Basic knowledge of Git

Salary & Job Roles

Web designers typically start with salaries ranging from £18,000 to £24,000, depending on their skill level and location. Experienced web designers can earn upwards of £35,000 to £50,000. They may specialize in certain areas such as UX/UI design or advance into roles like Art Director or Creative Lead. Web designers focus on the visual aesthetics and usability of a website. They bridge the gap between a website's functionality and aesthetics, ensuring that the end product is not only functional but also visually compelling. Their role often involves close collaboration with front-end developers to bring their designs to life in the web environment.

FRONT-END WEB DEVELOPER

Key Skills

JavaScript Programming	★★★★★
Responsive Design	★★★★
Cross-Browser Compatibility	★★★★
Performance Optimisation	★★★★
Testing / Debugging	★★★

Key Technologies

Languages: HTML5, CSS3/SASS, JavaScript (ES6+)
Frameworks/Libraries: React.js, Angular, Vue.js
Tools: npm, Webpack, Babel
Version Control: Git
CSS Frameworks: Bootstrap, Tailwind CSS

Salary & Job Roles

Starting salaries for front-end developers can vary widely, with a typical range from £25,000 to £35,000, depending on the region, experience, and complexity of the role.

With experience, front-end developers can progress into senior roles, potentially leading design and development teams, with salaries that can exceed £50,000.

BACK-END WEB DEVELOPER

Key Skills

Server-Side Languages	★★★★★
Database Management	★★★★★
API Development / Integration	★★★★
Security Compliance	★★★★
Version Control Systems	★★★★

Key Technologies

Server-Side Frameworks: Express.js for Node.js, Laravel for PHP
Databases: MySQL, PostgreSQL, MongoDB
Containerisation & Orchestration: Docker, Kubernetes
Cloud Services: AWS, Google Cloud Platform, Azure
Continuous Integration/Continuous Deployment (CI/CD): Jenkins, GitLab CI

Salary & Job Roles

The starting salary for back-end developers can vary, with entry-level positions typically ranging from £27,000 to £35,000. With experience and specialised skills, back-end developers can progress into senior positions, with salaries that can rise significantly, often reaching upwards of £60,000, especially in high-demand areas or for those with expertise in specific, sought-after technologies.

The back-end developer role is essential for any dynamic website or web application that requires server-side data processing, database management, and application logic. The above skills and technologies are crucial for a back-end developer to build robust and secure web applications.

FULL-STACK WEB DEVELOPER

Key Skills

Front-End Technology	★★★★★
Back-End Technology	★★★★★
Database Management	★★★★
Version Control / Git	★★★★
Testing and Debugging	★★★★

Key Technologies

Front-End: HTML5, CSS3, JavaScript, React.js, Angular, Vue.js
Back-End: PHP, Node.js, Express, Django, Flask, Ruby on Rails
Databases: MySQL, PostgreSQL, MongoDB
DevOps: Docker, Kubernetes, Jenkins, AWS, Azure
Tools: npm, Webpack, Babel, Git

Salary & Job Roles

The starting salary for full-stack developers is typically around £30,000 to £40,000, with the potential to grow significantly. Skilled full-stack developers can command salaries of £50,000 to £70,000 or more, depending on their experience, expertise, and the complexity of their work. As they can handle both client-side and server software, they are highly valued for their versatility in building complete web applications and often lead projects or teams.

Full-stack developers have a broad skill set that covers both front-end and back-end development, allowing them to understand and work on all aspects of web application development. Their knowledge spans the full breadth of the technology stack, from user-facing features to server-side data handling, making them invaluable assets to any development team.

CORE COMPETENCIES

Core competencies, which constitute the essential set of skills and knowledge in Web Development, are evaluated throughout the competition. These competencies are critical for showcasing expertise not only in front-end technologies but also in back-end development, involving server-side languages, database management, and application frameworks.

In the detailed outline provided below, the specific core competencies assessed at various stages of the competition are highlighted. This includes foundational skills in HTML, CSS, and JavaScript for front-end development, alongside proficiency in back-end technologies such as SQL for database management, PHP for server-side scripting along with PHP frameworks for web application development.

The ability of participants to effectively employ these technologies in creating comprehensive, responsive, and user-friendly web applications will be evaluated. Additionally, their capability to utilise frameworks and libraries such as React, Vue.js, Vite, or Bootstrap for front-end development, and their skill in applying back-end technologies to solve problems and implement solutions within a comprehensive web development context, will be assessed.

Beyond technical expertise, problem-solving and critical thinking are crucial core competencies in web development. Competitors must demonstrate the ability to analyse complex scenarios, identify potential issues, and implement efficient solutions across both front-end and back-end systems. Debugging and troubleshooting

skills play a key role, requiring developers to diagnose errors, optimize performance, and refine functionality. Additionally, proficiency in version control systems such as Git ensures structured collaboration, enabling seamless code management across different stages of development.

Building a robust front-end requires not only mastery of HTML, CSS, and JavaScript but also an understanding of modern frameworks and component-based architectures. Competitors should be adept at crafting scalable, maintainable, and responsive interfaces that offer seamless user experiences across devices. On the back-end, knowledge of server-side development, database management, and API integration is essential. Competitors must demonstrate the ability to build efficient data handling systems, ensure smooth interaction between client and server, and develop structured, well-documented codebases that align with industry standards. Strong competency in both front-end and back-end development ensures the creation of comprehensive, high-performing web applications.

This matrix (http://tinyurl.com/wsuk-matrix) serves as a comprehensive guide that aligns with every phase of the WorldSkills competition, starting from the initial *Stage 1* and extending to the global international stage. This detailed framework is designed to match the skills and assessment criteria required at each successive level of competitions.

TECHNOLOGICAL SKILLS

Web Development is typically divided into two main categories: **front-end** and **back-end** development. Each category uses different programming languages tailored to their specific tasks.

Front-End Development

This is the part of Web Development that involves building what users see and interact with in their web browsers. The cornerstone languages for front-end development include HTML, which is used for the structure and layout of web pages. CSS is then applied to style and design the visual elements, ensuring that the site looks appealing and is user-friendly. JavaScript is added to the mix to bring pages to life with interactive and dynamic features, such as responding to user actions, animating elements on the page, and communicating with web services.

Back-End Development

On the other hand, back-end development is focused on the server side, dealing with the database and server logic. It's the engine room of a website or web application. Languages commonly used in back-end development include PHP, a widely-used open-source scripting language and JavaScript via Node.js, which allows developers to use JavaScript on the server side as well. SQL is indispensable for database management, enabling developers to retrieve and manipulate data efficiently. These languages work together to process user requests, perform computations, and serve content to the front end.

Note: *While the introduction above outlines the key languages for front-end and back-end development as it pertains to the competition, it is noteworthy to mention that the field of back-end development encompasses a broader range of programming languages. Languages such as Java, Ruby, Python or Go are also integral to* *back-end development, offering different features and benefits. However, these are not assessed within the scope of this particular competition, but they hold significant value in the industry for their robustness, scalability, and performance in various web development environments.*

Development Technologies (Frameworks, libraries and databases)

In addition to core programming languages, web development extensively utilises frameworks and libraries to streamline the building process and enhance functionality. These tools provide pre-written code snippets, modules, and functionalities that developers can use to speed up development and ensure best practices.

For Front-End Development

Bootstrap - a powerful and popular front-end framework used for creating responsive and mobile-first web pages. Bootstrap provides a set of CSS and JavaScript tools that simplify the design process.

Tailwind CSS - a utility-first CSS framework that provides a set of pre-designed classes for building custom designs directly in your HTML. Tailwind simplifies styling by focusing on rapid development and consistent design without writing custom CSS.

React - a declarative, efficient, and flexible JavaScript library for building user interfaces. It allows developers to create large web applications that can change data, without reloading the page.

Vue.js - a progressive framework for building user interfaces. Unlike other monolithic frameworks, Vue is designed from the ground up to be incrementally adoptable.

Svelte - a modern front-end framework that compiles components into highly efficient JavaScript during build time. Svelte eliminates the need for a virtual DOM, resulting in faster, more lightweight applications with minimal runtime overhead.

For Back-End Development:

Laravel - a web application framework with expressive, elegant syntax for back-end development in PHP. It provides a robust set of tools and an application

architecture that includes features like an ORM, routing, authentication, and more.

Node.js - a JavaScript runtime built on Chrome's V8 engine, designed for developing scalable network applications. Node.js uses JavaScript for server-side scripting, offering a unified programming language for both the server and client sides. It's supported by a vast library of NPM packages, enhancing its functionality and making it a versatile choice for developers who prefer using JavaScript across both front-end and back-end development, complementing PHP frameworks like Laravel with a unified coding language experience.

Express.js - A minimal and flexible Node.js web application framework that provides a powerful set of features for building web applications and APIs. Express simplifies back-end development by offering built-in middleware for handling requests, routing, and error management, reducing the complexity of server-side logic. It supports RESTful API development, making it an essential tool for creating scalable and efficient web services. Its lightweight architecture allows developers to structure applications with custom middleware, enabling seamless integration with databases, authentication systems, and third-party services. Express.js is widely used for its efficiency,

making it an excellent choice for building modern, high-performance back-end solutions.

MySQL - a widely used relational database management system (RDBMS) that utilises Structured Query Language (SQL) for managing, adding, accessing, and processing data stored in a database. Known for its reliability, scalability, and speed, MySQL is an essential tool for developers working on web applications that require efficient data storage and retrieval. It allows for the creation of complex databases that can handle vast amounts of data, making it an indispensable part of the back-end technology stack.

It's important to note that while many other frameworks and libraries exist and are used professionally, the ones listed above are included in the scope of the competition. They have been selected for their wide adoption, strong communities, comprehensive documentation, and the ability to cater to various aspects of both front-end and back-end development. Each brings its own advantages and challenges to the development process and, depending on the project requirements and developer preference, can significantly impact the efficiency and quality of the final product.
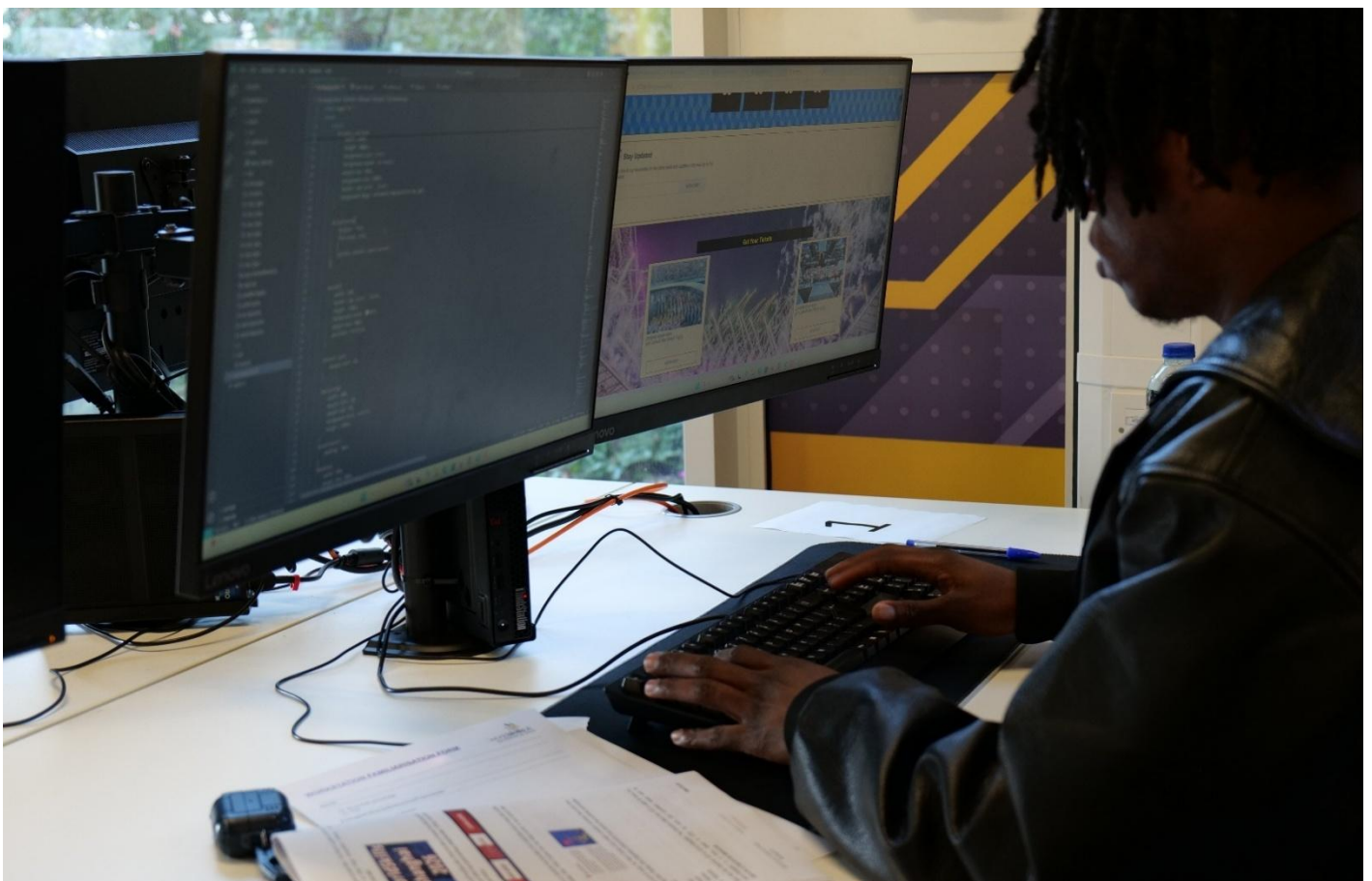
WEB DEVELOPMENT TOOLS AND RESORCES

Below, a list of the current software, applications, libraries and frameworks for use in the WorldSkills competitions is provided for your convenience. It is important to note that not all the software listed are required; participants are encouraged to select the applications that best suit their preferences and needs.

As a recommendation, consider focusing on software that aligns with your strengths and project requirements, ensuring you are comfortable and proficient with your chosen tools to maximise your performance in the competition.

NOTE: *Although some design tools, are listed below as examples, they are not part of this competition. Instead, all design elements must be created directly through code, requiring participants to implement and refine the visual aspects of the project(s) on the go.*

R = Recommended
M = Must

Tool	Available Platform/Purpose	Licence Type
Code Editors (IDEs)		
Visual Studio Code (R[1])	Win/macOS/Linux	Free
PhpStorm (R[2])	Win/macOS/Linux	Free (EDU Licence)
WebStorm	Win/macOS/Linux	Free (EDU Licence)
Design Tools		
Figma (R[1])	Win/macOS	Free (3 Collaborative)
Lunacy (R[2])	Win/macOS/Linux	Free
Axure (Prototyping)	Win/macOS	Free (EDU Licence)
Database Tools		
MySQL (R)	Win/macOS/Linux (Part of localhosts as well)	Free
PostgreSQL	Win/macOS/Linux	Free
Cross-platform web servers (localhosts)		
AMPPS (R[1])	Win/macOS	Free (No automatic updates)
XAMPP (R[2])	Win/macOS/Linux	Free
WampServer	Win	Free
Version Control		
GitHub (R)	Win/macOS/Linux	Free + (EDU Licence)
GitLab	Win/macOS/Linux	Free
Frameworks and Libraries		
Bootstrap	CSS/JS	Free
TailwindCSS	CSS	Free
Font Awesome	Icons	Free
Google Fonts	Icons	Free
React	JS	Free
Vue.js	JS	Free
Laravel	PHP	Free
Node.js	JS	Free
Express	JS	Free
NPM	Library & Package Manager	Free - Part of Node.js
Browsers and Plugins		
Chrome	Win/macOS/Linux	Free
Mozilla	Win/macOS/Linux	Free
Edge	Win/macOS/Linux	Free

|		
AXE DevTools (R)	Chrome/Mozilla/Edge	Free
WCAG ContrastChecker(R)	Chrome/Mozilla/Edge	Free
Web Developer (R)	Chrome/Mozilla/Edge	Free
WAVE Accessibility	Chrome/Mozilla/Edge	Free
Learning material and additional resource		
DevDocs (M)	*Official Documentations used in competition*	Free
Laracast	Laravel Learning	Free
CodeWars	Peer Skill Development	Free
CodeAcademy	Interactive Courses	Paid (Discount for Students)
freeCodeCamp	Interactive Courses	Free
SoloLearn	Interactive Courses	Paid
HappyCoding	Interactive Courses	Free

Competition Environment

Although most applications are cross-platform, in all WorldSkills competitions only Microsoft Windows (currently v11) is used along with a dual monitors setup environment.

All assessment work is to be completed without internet access.

All the software listed above are easily deployable and widely used in Schools, Colleges and Universities in the UK and internationally. Most applications also provide user-level installers, or standalone/portable editions if deployment is '*challenging*', but not always.
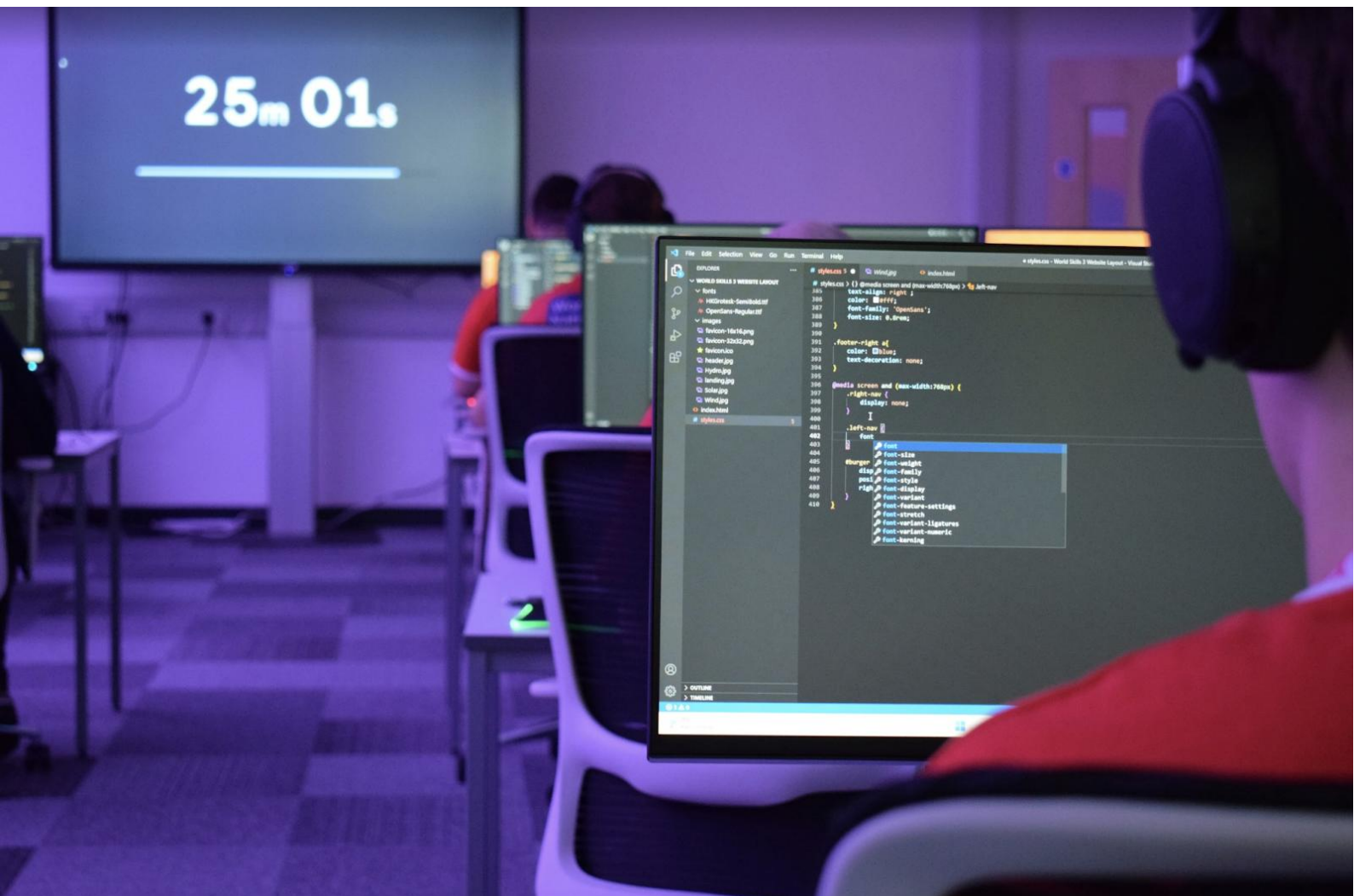
Alongside the marking guidelines and other materials detailed in this document, competitors are advised to get ready for the competitions by utilising the example assessments given below. The tasks included in the pre-competition activities, drawn from past competitions, are intended to demonstrate the kinds of tasks and skills that will be expected from participants along with the 2025 WSUK National Competition test projects and solutions.

Sample Assessments and Training Resources

Example assessments for each module can be accessed and downloaded from the resource repository provided below. Additionally, a variety of training materials, expert guidance, and examples of student work are being added to assist participants in preparing for this year's competition.

Sample Test Projects
(https://github.com/worldskillsuk/national-resources)

Entry Stage (Stage 1) - What to expect

Shortly after registration closes, you will be sent details of this year's online entry assessment. This stage of the competition will be online and will be testing your knowledge of:

- Web technologies and browsers
- File types
- Core HTML, CSS, JS & PHP knowledge
- Accessibility

Participants will be able to take the test one time only, and the test will be formatted as a quiz with a duration of 1 hour and 45 questions.

National Qualifier (Stage 2) - What to expect

For the national qualifier, you will be required to put your coding skills to test.

A brief/specification, a mock-up, assets (such as images and logos), and text for a sample website or web application will be provided to you. You will need to use your practical skills in HTML, CSS, and JavaScript to create a functioning webpage that matches the given design and functional requirements.

This task will take place under supervised conditions on a remote assessment platform, and you will have 3 hours to complete it. Full instructions will be given once you reach this stage.

National Finals (Stage 3) - What to expect

The National Finals are designed to challenge your skills and test your abilities. This competition will assess all core competencies through four modules conducted over two days. Participants are required to compete in person at the host venue, providing a hands-on and interactive experience.

Module A - Design Implementation

You will be required to develop a working website or web application based on a provided specification using HTML, CSS, and JavaScript. Given a brief, assets, and content, you will be expected to match the design as closely as possible, aiming for pixel-perfect accuracy. Best practices, accessibility (including adaptive and responsive website development techniques), and advanced use of CSS will also be assessed. While the use of front-end frameworks is permitted, it is not necessary, as the test project is designed to be completed using only vanilla CSS and JavaScript.

Assessment Duration: 3 hours
Internet Access: None

Module B - Front-End Development

You will be required to implement a solution to a given set of tasks using JavaScript. These tasks may include adding interactivity through events and DOM manipulation, debugging and fixing erroneous code, retrieving and handling data from a database through a provided API, and demonstrating best practices. Maintaining a clear project structure and documenting your code effectively are also assessed. While the use of front-end frameworks is not necessary to complete the test project, their use is highly encouraged to demonstrate advanced skills and industry-relevant practices.

Assessment Duration: 3 hours
Internet Access: None

Module C - Back-End Development

You will be required to develop a website or web application with server-side functionality. Typical requirements include authentication; interacting with a database to create, read, update, and delete data (CRUD); and securing parts vulnerable to exploits. You may write your solution in one of the permitted back-end languages of your choice.

Assessment Duration: 3 hours
Internet Access: None

Module D - Speed Test

You will be required to solve a series of mini-tasks that are categorised based on the approximate required time to solve them:

- Easy / 5 min
- Medium / 5–15 min
- Complex / 15-30 min
-

Assessment Duration: 3 hours
Internet Access: None

This aspect will assess your organisational skills, time management and ability to work under pressure.
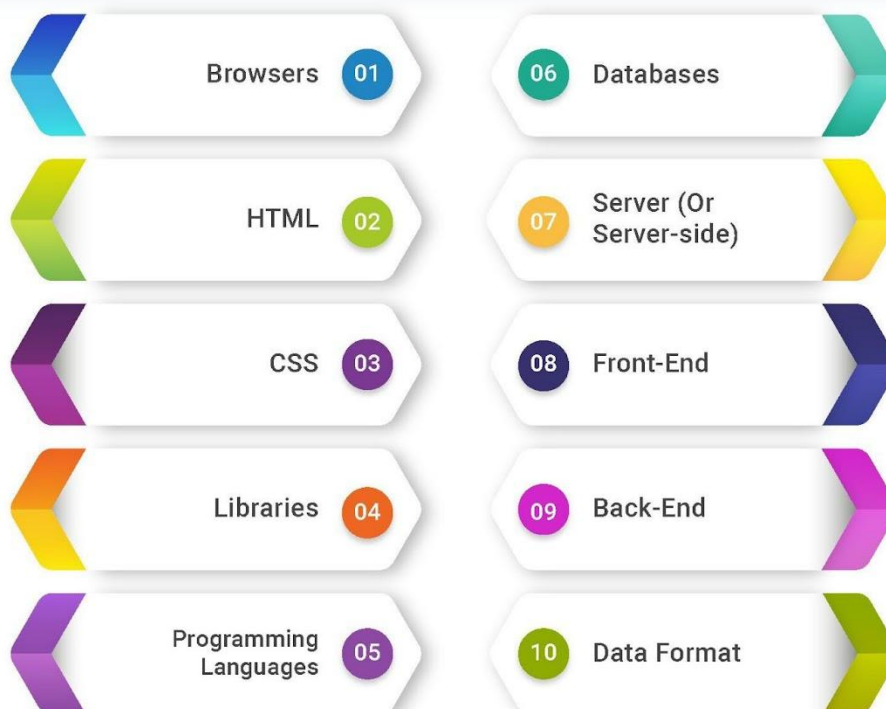
RESOURCES AND FURTHER INFORMATION

If you have any questions regarding the competition, please do not hesitate to get in touch.

The resources provided in this handbook, along with external learning materials, serve as essential tools for competitors to refine their web development skills. Taking full advantage of these resources can significantly impact performance, allowing competitors to deepen their understanding of front-end and back-end technologies, improve coding efficiency, and enhance problem-solving abilities. From official competition guidelines to recommended frameworks, libraries, and development tools, these materials offer invaluable insights into industry best practices and expectations.

Competitors are strongly encouraged to engage in continuous practice and independent study beyond structured training. Web development is a rapidly evolving field, and staying up to date with the latest techniques, frameworks, and methodologies is key to success. Hands-on experience, whether through building personal projects, contributing to open-source initiatives, or refining competition tasks, helps solidify knowledge and improve technical competency. Additionally, leveraging online documentation, coding challenges, and collaborative platforms like GitHub enrich a deeper understanding of real-world development workflows.

The competition is not just a test of technical skills but also an opportunity to develop resilience, adaptability, and professional-level coding habits. By actively utilizing the available resources, seeking feedback, and consistently refining their approach, competitors can maximize their potential and perform at their highest level on the national and international stage.

Primary Web Development Technologies

- Browsers **01**
- HTML **02**
- CSS **03**
- Libraries **04**
- Programming Languages **05**
- **06** Databases
- **07** Server (Or Server-side)
- **08** Front-End
- **09** Back-End
- **10** Data Format