



WorldSkills UK Web Design Competition 2021 - 2022 Technical Handbook

Contact Information



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Table of Contents

Introduction	1
Competition Overview	1
Careers	2
Jobs and Roles	3
Core Competencies	4
WorldSkills UK and the Computing Curriculum	
Digital T-Levels	10
Software & Tools	11
Pre-competition Activity	12
Passive Stage: what to expect	12
National Qualifier: what to expect	13
National Finals: what to expect	14

Introduction

Web Designers use coding and software applications to design, construct and implement websites, using both creative and technical skills in a rapidly evolving industry. Web development languages are amongst the most sought-after programming skillsets, with JavaScript currently in the lead as a growing number of traditional applications move to web platforms. Web design encompasses many different skills and disciplines in the production and maintenance of websites, from creative design, scripting and database management. Accessibility remains a fundamental of any website development project, ensuing that websites are accessible by anyone, on any device, anywhere in the world.

Competition Overview

During the WorldSkills UK web design competition, participants will receive a brief to work to 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:

Stage 1: Registration

Once you have completed your registration (and accepted all terms and conditions) you will be emailed a link to complete a Passive online test.

Stage 2: Passive

When the passive task has been completed you will be notified to let you know if you have scored high enough to go through to the national qualifiers (the semi-final round). You will then be informed when the National Qualifiers will take place.

Stage 3: National Qualifiers

Ensure you're ready to compete in your national qualifiers by looking at the **online training resources, core competencies and marking guidelines** below. The qualifier will be an online based activity, and unlike the passive stage, the national qualifier is a completed in controlled conditions using our online remote assessment platform (full instructions and login details will be provided when you qualify).

This handbook outlines the type of tasks you will be expected to carry out in the qualifiers below. 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 4: WorldSkills UK National Finals

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

Ensure you're ready to compete in the national finals by looking at the **core competencies** and **marking guidelines** below. This outlines the type of competencies 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 5: WorldSkills UK International Competitions

Please note the 2021 competition will not be a selection year for the international competitions.

Beyond the national finals, there are a host of opportunities for competitors. Age-eligible competitors who show the highest skills, passion, and drive from the national finals will be given the opportunity to compete to train for the EuroSkills and WorldSkills international competitions.

Those who are not eligible for international competitions may join the Champions programme, which allows continued involvement, including the opportunity to work with WorldSkills UK and visit schools, colleges, and events to inspire the next generations.

Alternatively, if training is of interest to you, you could consider supporting WorldSkills UK with organising and training, and even helping to run the National Finals.

Careers

For information on how to become a web designer, visit WorldSkill UK's designated webpage. As well, Yogi, our web design role model, who previously competed at WorldSkills UK has shared his experience of his career progression since taking part in our competitions. You can find his account of the competition journey and the benefit to his career, here.

Other Career routes are also outlined below.

Jobs and Roles

The sample roles below are full time positions found on LinkedIn jobs, suitable for candidates leaving College or University with little prior experience.





Back-end development is typically a lot more code (and database) orientated. Problem solving, attention to detail and familiarity with databases is essential.

Key Skills
Coding 🔶 🔶 🔶 🔶
Database Development 🛛 🔶 🖕 🖕 🖕
Knowledge of Frameworks 🛛 🛧 🛧 🛧 🛧
Knowledge of MVCs 🛛 🔶 🖕 🔶
Codebase Management 🛛 🔶 🔶 🖕
Teamwork $\overleftrightarrow{\uparrow} \overleftrightarrow{\uparrow} \overleftrightarrow{\uparrow} \overleftrightarrow{\uparrow}$
Key Technologies
PHP/Node.js/.net
Databases (SQL)
Knowledge or experience using an MVC
WebApp Development
Salary/Job Info:
Graduate Developer (Back-end WebApps) £25-34k

January 2021, Bristol, UK Availability: In demand (Language and salaries vary)



Front-End Website Developer

Salary/Job Info:

Graduate Front-End Developer £25-30k January 2021, Bristol, UK Availability: In demand (Particularly those with React experience!)

Core Competencies

Core competencies are the key set of skills and knowledge that are tested throughout the competition. Below will outline all the core competencies assessed and at which stage of the competition.

Website Development Core Skills	Passive Stage	Regional Qualifiers	UK Finals	International
Work organization and management (General)				
Code documenting and commenting				
File Management best practice				
Problem solving		3	\bigcirc	\bigcirc
Troubleshooting			\bigcirc	3
Error debugging and handling				0
Use of Version control systems (eg Git)				Ø
Website Deployment				Ø
Performance optimisation				
Module A: Design				
Create, manipulate, and optimize images		\bigcirc		3
Identify target markets and create concept for designs				0
Create responsive designs that function correctly on multiple screen resolutions and/or devices				
Transform ideas into aesthetically pleasing and creative designs				0
Critique draft concepts, colour, and typography choices				0
Create wireframes, interactive prototypes, and design of full user interfaces				0
Module B: Layout				
Standards compliant HTML5 & CSS (W3C)				3
Effective use of HTML5 semantics, ID's & Classes				0
CSS pseudo classes				Ø
Basic CSS Animation				0
3D animation	<u>_</u>			
Use of CSS pre/post processors				
CSS positioning & layout				
Responsive Grid Systems (Responsive/Adaptive web design)				0

Website Accessibility		0
SEO		\mathbf{O}
Module C: Front-End Development		
JavaScript		0
jQuery (eg Show/hide elements, manipulate DOM, Form Validation, interaction)	0	
JavaScript Animation		
JavaScript frameworks (eg React, Angular Typescript)		0
API interaction		0
JavaScript Data Manipulation		0
JavaScript Unit Testing		\mathbf{O}
Module D: Back-End Development		
Procedural PHP		
Protect against security exploits		\mathbf{O}
Object Orientated PHP		
Open Source server-side Libraries and Frameworks (Laravel)		\mathbf{O}
Use of SSH (NPM, file permissions and ownership)		\mathbf{O}
Design and create relational databases		\mathbf{O}
Basic procedural SQL (SELECT, INSERT, UPDATE, DELETE)		\mathbf{O}
PDOs & relational databases		\mathbf{O}
MVCs		\mathbf{O}
Unit testing/automated testing		0
Content Management Systems		
Install, configure, and update Content Management Systems		0
Install, configure, and update CMS plugins/modules		
Configure, implement security and protection on the CMS		
Use and modify open source theme starters to create themes for CMS		
Create custom themes/templates for Content Management Systems		
Create custom plugins/modules/ widgets		

Кеу	
\bigcirc	Current Expectations
	Future planed competitions

What language(s) should I learn?

The good news is there are loads of resources online to help you learn and develop- as well as some very supportive communities.

Client-Side Scripting

Client-Side Scripting languages are typically used in "Front End" development and are usually more creative and interactive. Start with the basics of HTML and CSS.

- Code Quality: Keeping your code neat, understandable, and well documented (code comments) is very important, particularly in industry. This is also assessed in competition too!
- Accessibility: Websites should be accessible to Anyone, Anywhere, on Anything. From
 responsive and reactive website design, screen-reader compatibility, standards compliancy,
 and website performance all sites should developed to be universally accessible regardless of
 user impairments, location, or digital technology.
- Search Engine Optimization: Companies will often rely heavily on search engines to channel traffic to their sites. There are no shortcuts to successful SEO, however there are many things we can do as developers and it is important to plan your SEO from the beginning.

The only JavaScript library used at WorldSkills UK is **jQuery**, however as you get more competent, JavaScript libraries such as React, Angular and Vue will allow you to build more powerful asynchronous web applications and are highly sought-after (and very employable) skillsets: A competent React developer with 3-4 years' experience can expect salary of £40,000-£50,00, or £300-£400 per day as a contractor!

Server-Side Scripting

Server-Side Scripting Languages are a little trickier: there are a lot more choices, including PHP, .net, Node.js... or even Ruby/Rails for the brave! Although we have found many larger UK companies appear to be using Microsoft .net (ASP, C# .net core etc), World Skills International use PHP and MySQL exclusively.

<u>PHP</u>

PHP is a mature, and very accessible server-side scripting language. Although PHP is sometimes seen as a

At the UK Finals you will be required to use procedural, vanilla PHP. At World Skills International, Object Orientation is essential, and PHP frameworks (currently Laravel or PHPStorm) are used, but don't worry: An extensive training programme delivered by industry experts is provided for those competing at International level!

Typical tasks required at World Skills (National Final) include:

- Form design/management (Contact forms, login, data input etc)
- Database interaction (see below)
- Data management and formatting
- Login/Authentication (SESSIONS)

• Security (eg SQL Injection protection, XSS, password hashing)

MySQL

MySQL (or MariaDB!) is a very popular relational database engine used to power a significant proportion of the web: If you have prior experience using Microsoft SQL Server or Microsoft Access (*shudders*) you will find these are very transferable.

Typical tasks required at World Skills (National Final) include:

- Design, create and manage a small relational database
- Perform basic SQL operations (eg SELECT, INSERT, UPDATE, DELETE, JOIN)
- SQL security considerations

The Rise of the WebApp

Advancements in web platforms, portability, scalability and desire for highly interactive online experiences have resulted in Web Applications replacing many traditionally 'installed applications. Much of the software that may have traditionally been downloaded, installed/deployed and run is now web based: the chances are your college/university registers, timetabling, HR, banking, training and financial platforms are now more likely to be web-based! Web development is increasingly less restricted to consumer-facing websites and e-commerce solutions: The greatest industry growth/demand is in Web applications.

WorldSkills UK and the Computing Curriculum

The below outlines the core competencies expected of competitors, measured against qualifications related to web design.

Website Design Standards Mapping	Level 2 BTEC	Level 3 BTEC	Level 4*	T-Level	BSc DaTS	۲ ۲
Work organization and management (General)						
Code documenting and commenting	В	P		Î	A	
File Management best practice	B	P		7	A	
Problem solving		P		7	A	
Troubleshooting		P		7		
Error debugging and handling					A	
Use of Version control systems (eg Git)						
Website Deployment				7	A	
Performance optimisation		P		7	A	
Module A: Design						
Create, manipulate, and optimize images	B	P		Î		
Identify target markets and create concept for designs	B	P		7	A	Õ
Create responsive designs that function correctly on multiple screen resolutions and/or devices				7	A	Ð
Transform ideas into aesthetically pleasing and creative designs		P				
Critique draft concepts, colour, and typography choices	B	P				
Create wireframes, interactive prototypes, and design of full user interfaces		P		1	A	Ð
Module B: Layout						
Standards compliant HTML5 & CSS (W3C)	B	P		7	A	
Effective use of HTML5 semantics, ID's & Classes		P		1	A	J
CSS pseudo classes		P		1	A	
Basic CSS Animation					A	
3D animation						
Use of CSS pre/post processors					A	
CSS positioning & layout		P		Î	A	
Responsive Grid Systems (Responsive/Adaptive web design)		P		7	A	Ø
Website Accessibility	В	P		7	A	Ø
SEO		P		7	A	Ø
Module C: Front-End Development					-7/1/	

JavaScript		P	î	A	B
jQuery (eg Show/hide elements, manipulate DOM, Form Validation, interaction)		P	1	A	Ð
JavaScript Animation					
JavaScript frameworks (eg React, Angular Typescript)				A	
API interaction			Î	A	
MVCs				A	Ð
JavaScript Data Manipulation				A	Ð
JavaScript Unit Testing					
Module D: Back-End Development					
Procedural PHP		P	1	A	
Protect against security exploits			1	A	P
Object Orientated PHP				A	Ð
Open-Source server-side Libraries and Frameworks (eg Laravel)					P
Use of SSH (NPM, file permissions and ownership)				A	
Design and create relational databases			1	A	
Basic procedural SQL (SELECT, INSERT, UPDATE, DELETE)			1	A	P
PDOs & relational databases				A	
MVCs			Î	A	Ð
Unit testing/automated testing			Î		
Content Management Systems					
Install, configure, and update Content Management Systems	B				Ð
Install, configure, and update CMS plugins/modules	B				
Configure, implement security and protection on the CMS					
Use and modify open source theme starters to create themes for CMS					Ø
Create custom themes/templates for Content Management Systems					
Create custom plugins/modules/ widgets					

Level 2

BTEC, Cambridge Tec, T-Level transitional programmes Level 3 BTEC Nationals (QCF) 2010 Unit 20: Client Side Customisation of Web Pages Unit 27: Web Server Scripting Unit 28: Website Production Level 3 BTEC IT (RQF) 2016 Unit 6: Website Development Level 3 BTEC Foundation Diploma in Computing (2020)

Unit 15: Website Development

Level 4

New programmes announced- awaiting draft specs.

BSc Digital and Technology Solutions (L4-L6)

BCS standards specification- although modules and content will vary across institutions and your pathway.

Digital T-Levels

The new Digital T-Levels currently being rolled out are very well aligned with World Skills Web design, up to a National competition level, and close to International standards: At Weston College we began delivering T-Levels from September 2020 and hope many of the resources developed to support competitors may be of benefit across these programmes.

/hat students need to learn	
.1 Select and use languages to create a software solution for a software ppropriate to the context and market environment in which they are eveloping software	re project
Select and use at least two appropriate languages to implement front-end and back-end solutions: Python C, C# and C++ Javascript frameworks (Angular, React) Java Go Ruby PHP SQL Node-Js. Be able to embed programming languages within HTML5 and CSS as required. Be able to select and use appropriate application programming interfaces (APIs), packages, modules and libraries to add functionality and compatibility: generating dynamic page content containerisation stateful vs stateless components form handling file and data handling: - handle local files - create, open, read, write, delete and close files on a server - send and receive cookies - add, delete and modify data in a database interface components media content	M1 M2 M3 M4 M5 M6 M7 M8 M10 D1 D2 D3 D4 D6

Digital T-Level Spec v1.0

Software & Tools

Please find a list of the current software available to use in the WorldSkills competitions below. You do not need ALL the software and are free to choose your preferred applications!

Website Design		
Adobe CC: Photoshop &	Win/MacOS	Commercial
Illustrator *		
Adobe XD	Win/MacOS	Free
Paint.net	Win/MacOS/Linux	Free (Open Source)
GIMP	Win/MacOS/Linux	Free (Open Source)
Client-Side Scripting		
Visual Studio Code*	Win/MacOS/Linux	Free (Open Source)
Brackets (discontinued 😣	Win/MacOS/Linux	Free (Open Source)
Notepad++	Win/MacOS/Linux	Free (Open Source)
Atom	Win/MacOS/Linux	Free (Open Source)
Google Chrome	Win/MacOS/Linux	Free
Edge Chromium	Win/MacOS/Linux	Free
Firefox Web Developer Edition	Win/MacOS/Linux	Free (Open Source)
FileZilla FTP Client	Win/MacOS/Linux	Free (Open Source)
Server-side Scripting		
XAMPP	Win/MacOS/Linux	Free (Open Source)
PHP 7.4+ (8.0 in testing)	Win/MacOS/Linux	Free (Open Source)
MySQL or MariaDB (Latest)	Win/MacOS/Linux	Free (Open Source)
PhpMyAdmin (Latest)	Win/MacOS/Linux	Free (Open Source)
Apache 2.4	Win/MacOS/Linux	Free (Open Source)
PHPStorm		Free for
		students/educators.

*Where possible we use Open Source/freely available, cross-platform software: The only exception to this is the Adobe Creative Cloud (Illustrator or Photoshop).

The passive competitions have been designed to work with any graphics application, however we would highly recommend using Adobe CC at National and International levels.

Competition Environment

Although most applications are cross-platform, in all WorldSkills competitions only Microsoft Windows (10) is used. You will also have access to dual monitors (1920*1080). All assessment work is completed <u>without</u> internet access.

Educators: All the software listed above is 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.

Pre-competition Activity

In addition to the marking guidelines and other resources outlined further below this document, competitors are encouraged to prepare for the competitions by making use of the sample assessments provided below. The tasks outlined within the pre-competition activity are sampled from previous competitions and designed to outline the type of tasks and skill that will be expected of you.

Passive Stage: what to expect

The passive stage will consist of a Website Design project. You will be provided with a brief, assets (images, logos etc) and text for the site, which can be created in any widely used graphics design application of your choice (We recommend, Adobe Photoshop, XD, Paint.net, GIMP etc). Please see "Core Competences" section for further details of assessed skills.



A sample passive stage assessment can be downloaded <u>here</u> for you to try.

We even also some sample student work available <u>here</u>. NOTE: We highly advise you try the supplied demo task FIRST, before viewing the sample work as it may influence your own designs 😊

National Qualifier: what to expect

For the national qualifier you will be required to put your coding to the test! At this stage you will be required to apply your practical skills using HTML, CSS and a small amount of JavaScript. Please see the software listing above for recommended IDEs. Typically you will be required to complete a series of tasks code a working webpage to a high standard. Please see "Core Competences" section for further details of assessed skills.

Unlike the Passive stage, the National Qualifier is a completed in controlled conditions using our online remote assessment platform (full instructions and login details will be provided when you qualify).



A sample national qualifier assessment can be downloaded <u>here</u> for you to try.

National Finals: what to expect

During the national finals there will be four modules that competitors will be assessed:









Speed Challenge (New 2021)

The speed challenge will consist of a selection of much smaller tasks using both Client Side and Server-Side Scripting. Competitors must complete as many tasks as possible in each timeframe. It is unlikely you will be able to complete every task, therefore time management, working under pressure and tactical selection of the tasks undertaken will be critical in this module!