

WORLDSKILLS STANDARD SPECIFICATION

Skill D1

3D Digital Game Art





THE WORLDSKILLS STANDARDS SPECIFICATION (WSSS)

GENERAL NOTES ON THE WSSS

The WSSS specifies the knowledge, understanding and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSSS).

The skill competition is intended to reflect international best practice as described by the WSSS, and to the extent that it is able to. The Standards Specification is therefore a guide to the required training and preparation for the skill competition.

In the skill competition the assessment of knowledge and understanding will take place through the assessment of performance. There will not be separate tests of knowledge and understanding.

The Standards Specification is divided into distinct sections with headings and reference numbers added.

Each section is assigned a percentage of the total marks to indicate its relative importance within the Standards Specification. The sum of all the percentage marks is 100.

The Marking Scheme and Test Project will assess only those skills that are set out in the Standards Specification. They will reflect the Standards Specification as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme and Test Project will follow the allocation of marks within the Standards Specification to the extent practically possible. A variation of five percent is allowed, provided that this does not distort the weightings assigned by the Standards Specification.

WORLDSKILLS STANDARDS SPECIFICATION

SECTION		RELATIVE IMPORTANCE (%)
1	Work organization and management	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> Regulations and requirements for safe working practices Terminology specific to the sector and role How to plan for and manage time and tasks Saving regular backups of work to avoid file corruption File management and structure for interpretation by the team and for optimal use transferring between hardware 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> Conform to professional standards at all times Take responsibility for all production processes Set-up and maintain file structures Manage their own time Recover from setbacks Communicate and work with others for the common benefit 	



2	Interpretation of the design brief	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The 3D digital game market • Art styles and how to read and work to a particular set style • Platform specifications and the restrictions and opportunity they afford to polygon counts and texture sizes. • Asset list priorities to determine what are the most important assets to spend time on and what can utilise duplication/re-use. 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Determine the art style, colours, themes, and audience • Select an appropriate approach based on platform, genre, and game type. • Produce an asset list and determine timescales, polycounts, and texture sizes 	
3	Concept art	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • Silhouette of objects and characters to portray shape, mood, mass, and movement. • Values of greyscale to draw viewers' attention to important aspects of the asset • Colour theory for choosing base colours, secondary, mixing, and balance. 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Digitally paint demonstrating form, line, shading, perspective, proportion, light, and shadow. • Create customised brushes to produce appropriate effects and make efficient use of time. • Choose appropriate software to paint the concept art pieces in with maximum production in the swiftest time • Review and select each piece of concept art to inform the look of the finished 3D models 	
4	3D Modelling	25
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • Geometric principles in determining how to build the asset • Symmetry in creating a base model that allows for efficient use of the material later on in the process. • Polygon counts that are proportional to detail and focus on the asset. • Edgeflow that evenly distributes vertex points over the model for a balanced texel density and even silhouette. 	



	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Select an appropriate piece of 3D modelling software to begin the model. E.g. 3DS Max or Maya for hard surface modelling, or a sculpting tool like ZBrush for organic sculpts.• Utilise skills in sculpting, edge modelling, and box modelling to produce the basic form of the model• Use tools and modifiers to create further details on the model• Constantly review the model from all angles to determine refinements, improvements, and additional detail	
5	UV unwrapping	20
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• Mirroring shells to maximize texture space and texel density.• Proportions equitable by important sections of the asset.• Spacing of shells that maximize the usage of the texture sheet but avoid colour bleeding between shells• Grouping of shells by colour to further avoid colour bleeding	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Use UV unwrapping tools to project maps on to all the surfaces of the 3D asset• Separate the surface into appropriate shells to flatten over the UV space.• Organize the shells to make the most of space• Group shells with similar colours together• Export the UV coordinates to a texture tool or painting software	
6	Texturing	20
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• Painting colour and details to represent a variety of physical materials like wood, plastic, metal, fabrics, etc.• Diffuse colour maps that represent base colour of a material• Specular maps that represent the shine in order to produce realistic metal, plastic, or wet and oily surfaces.• Opacity maps that use alpha maps to produce complex objects on a 3D flat plane, e.g. grass, hair, branches, wire.• Normal maps and producing high resolution models to project using cages onto low resolution models.• Ambient occlusion that uses the 3D information to render shadows onto a flat texture based on proximity of polygons	



	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Select an appropriate piece of software to produce textures and materials e.g. PhotoShop and Substance Designer.• Paint a variety of physical materials and adapt to the art style set out in the brief.• Paint or engineer a specular map for controlling shine and glossiness of a surface• Paint an opacity map (if required) to handle complex objects or sections of an asset• Export a normal map from an appropriate piece of software• Render an ambient occlusion map to emphasize shadows.	
7	Rigging and animation	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• That bones are created to move 3D models in a games engine and can be built in chains of hierarchy to affect parts of a 3D model dynamically.• That forward kinematics is a top down structure where parents move each child. Inverse kinematics is a bottom up structure that allows the child to move the parent objects all the way up the chain.• Skinning a model so that each bone is given influence over vertex points on the 3D mesh, either absolutely, or in combination with other bones for organic motion.• Key frame animation to allow animators to place fixed points of movement, rotation, and scale across a timeline for the software to interpolate motion between them	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Create and link bones together to form the structure of the asset.• Set up a parent child structure for FK or IK.• Skin the mesh and paint how the bones influence the 3D model.• Set simple animation keys to test the motion of the asset in an engine.	
8	Export to games engine	5
	<p>The individual needs to know and understand</p> <ul style="list-style-type: none">• Beauty renders utilize material shaders and lighting to represent the asset that should be posed by the artist to show off the asset's most important aspects. Sometimes beauty renders have post render effects and painting applied afterwards for marketing purposes.• Exporting files must be set up correctly and in the appropriate format to be imported to engine.• Importing to engine requires varied approaches based on the game engine being used, and may require some set up in the engine.• Testing the asset in the engine should encompass any animation and deformation, as well as checking textures and lighting apply in the correct way intended.	



	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Choose and use a renderer, pose the object and select appropriate lighting and settings to highlight the best qualities of the asset.• Export 3D models and animation into a games engine.• Select an appropriate game engine and test the asset for model, UV, and deformation errors.	
	Total	100