

WorldSkills Standards Specification

3D Digital Game Art

Creative Arts and Fashion



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 only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

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. This is often referred to as the “weighting”. 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
	The individual needs to know and understand: <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 and naming conventions • 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"> • Conform to the art style, colours and themes • Select an appropriate approach based on platform, genre, audience and game type. • Produce an asset list and determine timescales, polycounts, and texture sizes 	
3	Concept art	13
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • Silhouette of object/s and character/s 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. • Use digital techniques 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 model/s 	

4	3D Modelling	28
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • Geometric principles in determining how to build the asset/s • Symmetry in creating a base model that allows for efficient use of material/s later on in the process. • Polygon counts that are proportional to detail and focus on the asset/s. • Edgeflow that evenly distributes vertex points over the model/s 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, or box modelling to produce the basic form of the model/s • Use tools and modifiers to create further details on the model/s • Constantly review the model from all angles to determine refinements, improvements, and additional detail • Use optimization techniques on the model/s 	
5	UV unwrapping	10
	<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 • Bake UV from the 3D asset 	

6	Texturing	22
	<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 etc. • Paint a variety of physical materials and adapt to the art style set out in the brief (e.g. hand-painted and/or PBR etc) • 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 variety of maps (normal, specular, ambient occlusion etc) from an appropriate piece of software and import into the preferred 3D software 	
7	Rigging and Animation	12
	<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. • The tool to set up appropriate IK chains with relevant constraints. • 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 • How to make animation into the asset 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Create an appropriate bone structure to form a working rig for the in-game asset. • Set up a parent child structure for FK or IK chain. • 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 game engine	5
	<p>The individual needs to know and understand</p> <ul style="list-style-type: none"> • How to 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. • Exported 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 rig/animation into a games engine. • Select an appropriate game engine and test the asset for model, UV, and deformation errors. 	
	Total	100

REFERENCES FOR INDUSTRY CONSULTATION

WorldSkills is committed to ensuring that the WorldSkills Standards Specifications fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Standards Specification on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (<http://www.ilo.org/public/english/bureau/stat/isco/isco08/>)
- ESCO: (<https://ec.europa.eu/esco/portal/home>)
- O*NET OnLine (www.onetonline.org/)